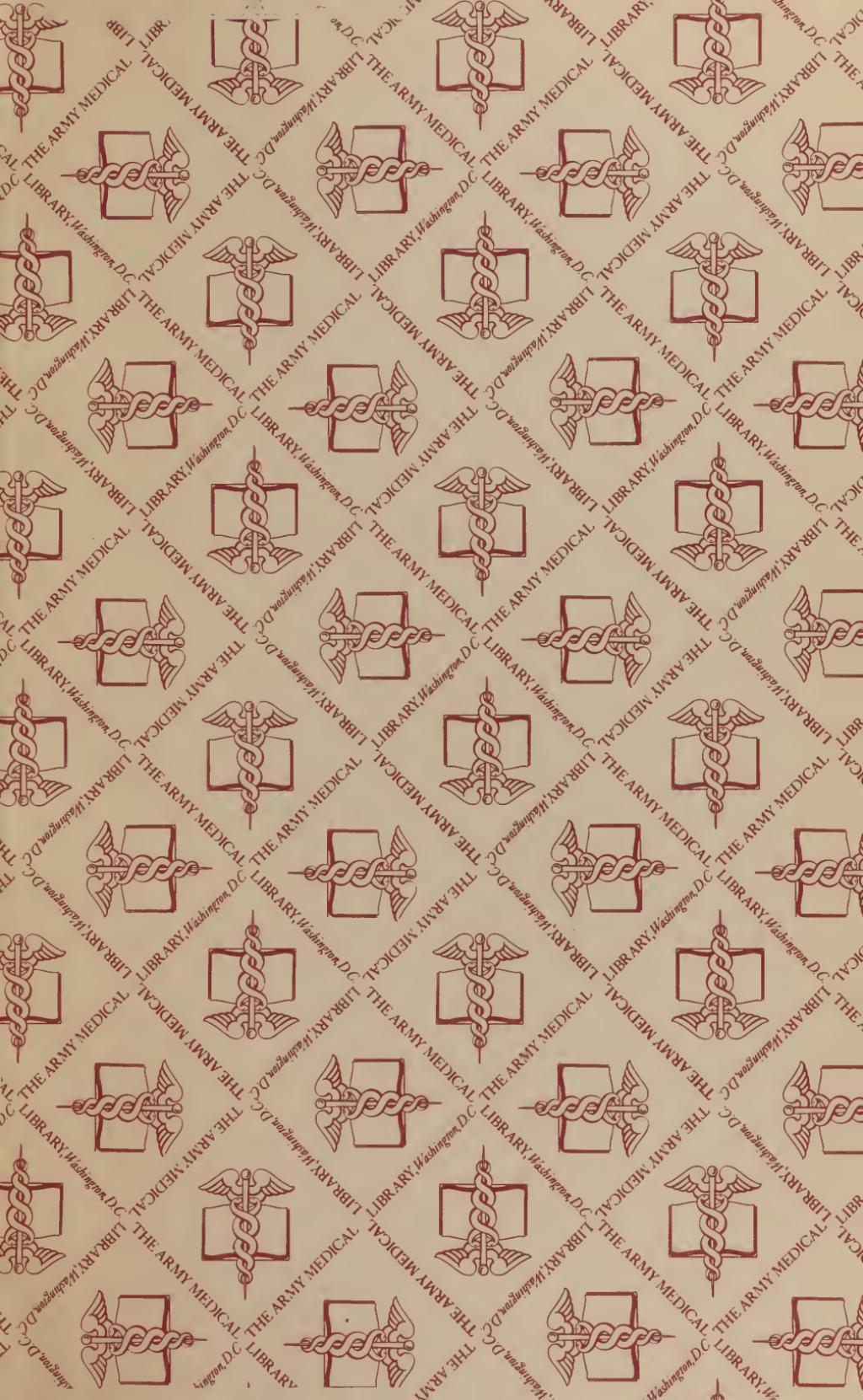


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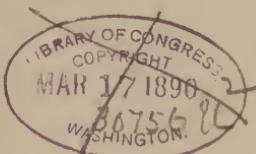
A HANDBOOK
OF
FAMILY MEDICINE
AND
HYGIENE.

TOGETHER WITH
DESCRIPTIONS OF REMEDIES, NUMEROUS CHOICE
FORMULAS, DIETARY FOR THE SICK,
RULES FOR NURSING, ETC.

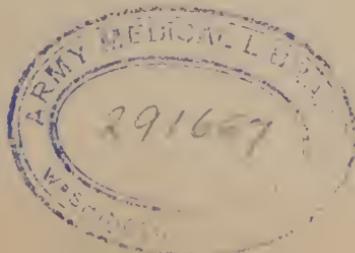
BY
WILLIAM H. COOK, A.M., M.D.

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SURGICAL DISEASES AND OPERATIVE SURGERY, WOMAN'S BOOK OF
HEALTH, MAN AND THE GENERATIVE SYSTEM, ETC.

"*Health is infinitely before all the excellences of the body.*"—CHARRON.



CINCINNATI:
GEO. P. HOUSTON, PUBLISHER.
1890.



Annex

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P R E F A C E.

THIS volume has been written expressly for the People, in language they can readily understand, with instructions they can easily follow. The affairs it discusses are more important to every human being than any business that one can possibly engage in. These embrace the following objects:

I.—To build up and to preserve a sound constitution.

II.—To prevent disease by knowing and observing the true laws of health; and thus to save much suffering, expense, and danger.

III.—To manage the sickness that comes to all, by correct, reliable and absolutely safe Home Treatment.

IV.—To feed and to nurse the sick and delicate to the best age, and thus to hasten recovery and renewed health.

Hygiene is presented the latest accurate and scientific edge in the preservation of Personal Health, of Public and Sanitation, the Health of Homes and Schools, and the advancement of National Vigor.

In the Treatment of Diseases, all errors of the past are laid aside, and the people are given the benefit of all true scientific advances in the Healing Art.

The Remedies directed are all safe in the using, such as can be obtained readily, and are prepared in the most pleasant and the most effective forms.

At each point in these several departments the information is full and explicit. Nothing essential is neglected; nothing is cut down to such narrow proportions as to give but a mere smattering, and thus to leave one helpless in the very hour when help is needed from this volume. The book is based upon thirty-seven years of active professional life, and the experience in the needs of Families that so many years of practice have given.

W. H. C.

CINCINNATI, October, 1889.

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A HANDBOOK
OF
FAMILY MEDICINE AND HYGIENE.

PART I.—HYGIENE.

CHAPTER I

GOOD HEALTH AND ITS PRESERVATION.

"HEALTH is infinitely before all the excellences of the body. Health is the loveliest, the most desirable, and the richest present in the power of Nature to confer."

Thus wrote an old English author; and his estimate of the value of good health is promptly accepted by those who have lost that precious gift. Trifled with and neglected by those who are in full possession of it, and often treated as if it were impossible to lose or to drive it away; all the wealth that man ever counted would be given to secure its return when once it has been broken or destroyed.

Good health is necessary to ease and comfort and enjoyment in daily life; to comeliness of person; to vigor and endurance in physical or mental effort; to clearness and breadth and force in thought; to elevation of feeling; to pure and lofty moral emotion. One may labor and think and desire in temporal affairs, and may reach forward earnestly in spiritual things, while his bodily soundness is in some part shaken or defective. But in every effort such an one realizes that a restraint is upon him, that an impediment checks his progress, that there abides with him an inability which prevents the attainment of what otherwise would be possible. At the supreme moment in his efforts, he fails. What to the man of sound body would be accomplished easily, is to him of defective strength so far beyond his reach as to compel a large measure of disappointment. Whether he be a farmer, mechanic, merchant,

manufacturer, student, lawyer, capitalist,—ill health, physical weakness, with the bodily and mental limitation it involves, is a daily burden making his calling wearisome, and hindering his advancement in competition with other men as a crippled foot would impede one running a race.

The human frame is endowed with marvelous powers for the maintenance of health. That mysterious property which we designate as *Life*, is ever in action to preserve the structures of the body. By the union of two insignificant germs, this property was called into operation and powers of development were set in motion. Without such contact of those two germs—one furnished by the male, the other by the female—each will perish without any result to its existence. But when fecundation takes place by their junction, there begin at once a series of changes and growths marvelous in their variety and complexity. A heart is formed, and arteries and veins are connected with it. A brain is shaped, and with it a spinal cord and nervous prolongations. Minute deposits of bone are made, and in due time the two hundred and forty bones of the skeleton are fashioned, and the four hundred and more muscles attached to them. Liver, stomach, intestines, kidneys, lungs, genitals, eyes, ears, and all the other organs, with the delicate tissues and peculiar functions belonging to each, are established ere this new being is born. And all these growths, with the wonderful intricacy belonging to each, take place under the controlling guidance of this new Life Force. All is exact, uniform, harmonious, in regular time and order—built up silently and accurately, by processes so delicate and incomprehensible that we cannot understand even the single law that determines the time when the new being shall be separated from its mother and ushered into the world. The fecundation of the germ and the birth of the child are acts we cannot fathom; and so are all the processes of development that lie between them. We can only stand in mute and humble admiration of the work of the Vital Power which we cannot comprehend.

And this Power, which thus fashioned a human being so wonderfully, and developed an immortal soul so mysteriously, continues its work while the life of that being lasts. For years after the child's birth the growth of bone and muscle and brain continues, till the full stature and ripeness of adult life have been reached. And the several organs of secretion and sense proceed to the discharge of their offices—the harmonious action of them all consti-

tuting the sum of man's healthful existence, till such time as old age, or accident, or disease, impairs the movements of the complex mechanism or removes it from the field of life.

And this Vital Power or Life Principle is constantly exerting itself to protect this body which it has builded, to shield it from dangers, to resist the influences of disease, to repair the damages of accident. It heals up wounds, mends broken bones, ejects poisons, overcomes obstructions, sustains against the vicissitudes of heat and cold, endures the outrages of gluttony and drunkenness, and is in perpetual warfare with the numerous circumstances, tending to bodily destruction, by which man is surrounded. Always, and at every point, it is on the alert to ascertain the presence of danger and to rally the resources of the body for the overthrow of harmful influences.

And this benign Power never ceases its vigilance and its efforts while life lasts. So long as a nerve can feel or a blood-vessel can move, every threatening invasion of disease is known and heralded. Its efforts are always toward preservation and toward cure. Man can afford no help in the removal of disease, except as he cooperates with and assists this wonderful Life Power, which is already struggling to restore health. While it retains its hold upon the organs, this struggle will go on. When it begins to lose its hold upon a part, the resistive struggle in that part will lose its vigor. When this Power has lost all control over a portion or the whole of the body, then decomposition begins in accordance to chemical laws; but so long as Vital Force retains the supremacy, it prevents all forms of decomposition in direct opposition to every chemical law and every chemical change.

Loss of vital control is death. Whatever weakens this control, or interferes with it, or subverts it from its true purposes, favors disease and death. Whether such interference be intentional or unintentional, its effects are alike damaging. The bullet piercing the heart causes death, whether fired purposely or by accident. The poison taken into the stomach endangers life, whether taken purposely, or given by mistake, or administered under the superstition that it might do good. Disease is favored and danger increased exactly in proportion to the weakening of vital control over the tissues and organs. Those with full rich blood and strong vital action resist successfully the many unhealthful influences that surround them, and rarely are ill; they rally quickly and recover rapidly from disease, even from that which is exceedingly severe;

and they usually live to a good old age. But the feeble, ill-fed, and thin-blooded, are easily affected by unhealthy influences, yield readily to the causes of disease, are frequently ill, rally slowly and imperfectly from sickness, and mostly die in early or middle life. Man's capacity of resistance and power of recuperation are measured by the completeness with which the Life Power occupies and uses each tissue and organ of his body. The degree of firmness and tenacity of such vital possession, indicates the strength or feebleness of one's CONSTITUTION. A *good* constitution endures hardships, exposures, mishaps, sickness, in a surprising manner; and comes out of them intact when all seems hopeless. A *poor* constitution, or one originally good but now broken, sinks under circumstances that to the other would be almost without danger.

One's constitution is born with him. A good one may be injured or wrecked by influences or accidents beyond his control; but most frequently it suffers damage by his own imprudences and indiscretions, and through outrages upon it that he inflicts deliberately and with full knowledge of what the consequences must be to him. Presuming upon his vigor, the man possessed of a fine constitution too often subjects it to utterly needless trials, rejecting advice founded upon the experience of others, in his vanity believing that *he* will not be scathed or scotched by a course that has ruined millions before him. Such childish conceit generally pays a fearful price for the knowledge it once rejected, but which is finally learned through a bitter experience that has left desolation in its track.

But, fortunately, while disobedience to healthful laws will injure the grandest constitution, those who enter upon life with but indifferent strength may increase their stock of Vital Force by judiciously observing those laws. Few, indeed, are they who cannot improve their constitution, gain tone and power, enlarge their resistive capacity, and multiply bodily vigor. A merciful Creator has so arranged the laws of health that their observance is both simple and pleasant, and the reward of such observance very great. By it the feeble muscle gains firmness, the soft bone grows hard, the delicate stomach improves its digestive powers, over-sensitive nerves become steady and controllable, weak and listless bodies acquire liveliness and elasticity. Constitutions originally feeble may not be made equal to the originally strong; but they can be improved to an extent that is often surprising, and so come to sustain one through a really healthful life. While the vigorous

are often reckless, and pay the penalty of their fool-hardiness in premature decay; the very sensitiveness of the feeble commonly makes them careful, and their faithful obedience to the laws of life often preserves them from any severe sickness, and secures them good health prolonged to a comfortable and happy old age.

CHAPTER II.

THE LEASE OF LIFE.

MOSES, after sketching the creation and outlining the great length of life enjoyed by men who "walked with God," records the after purposes of the Lord concerning the life of men when these were left more completely to physical laws. "And the Lord said, My spirit shall not always strive with man, for that he also *is* flesh: yet his days shall be one hundred and twenty years." (Gen. vi: 3). Centuries afterward, David observed that "the days of our years are three-score years and ten; and if by reason of strength they be four-score years, yet is their strength labor and sorrow: for it is soon cut off, and we flee away." (Psalm xc: 1c). It is commonly accepted that the words of the Psalmist record the divine purpose; but David merely states his own observation of facts growing out of the iniquities of men whose sins had brought them under God's displeasure. The Lord's edict as recorded by Moses has not been altered, except as man's own disobedience to the laws of life has interfered with His purposes.

Different writers on physiological topics, in considering this question, have from the laws of development and of reproduction drawn the conclusion that man's average age should be fully one hundred years. The pagan scholar, Aristotle, first enunciated this doctrine, which Buffon long afterwards put in more scientific shape, and Flourens, Hufeland and others more carefully elaborated. It was observed that animals were capable of sustaining life a certain multiple of the years they occupied in "getting their growth." Flourens first give exact data for determining the completion of any animal's term of growth, referring it to the bony structures, which are the last to cease growing.

Long bones, as the ribs and extremities, are formed by the deposit of earthly matter in cartilage; and these extend their length

by forming cartilage at the ends and gradually depositing bony material in this. Many flat bones, as in the skull, first form a membrane and deposit the earthy matter in this—the “openings” in the cranium of the infant being places where this membrane is without bony deposit, but afterwards close up by ossifying like the other cranial bones.

The first processes of bone-making in the embryo are found at the end of the fifth week after conception, being in the collar bone and lower jaw. By the end of the seventh week, points of bony growth are formed in the thigh, upper bone of arm, shin bone, upper jaw, and palate bones; and the formation of muscle begins to be noticeable. By the end of the eighth week, bone is observed in the two lower bones of the arm, the haunch bones, and the splint or small bone of the leg; and the spinal column consists of well-formed cartilages. At the ninth week, minute bony points appear in the spinal cartilages, the cheek bones, and the long bones of the hands and feet. It is not till the end of the third month that the membrane investing the brain commences to show bony deposits in some of the lower portions, gradually increasing and extending to form the skull during the remaining six months of its maternal life. The spinal bones also continue to form during these months; the germs of the first teeth show bone elements by the end of the fifth month. Each osseous formation has its fixed time for starting and its fixed rate of development; and it is only in rare and anomalous instances that these times and rates are found to vary.

When the child is born, the bony growth is by no means completed. Membranous “openings” remain in the cranium and the edges of some of these bones are also membranous—facts illustrating the wonderful provisions made by the Life Principle, as no child of natural size could be born alive if these growths were completed and its cranium incapable of yielding. The spine is still largely cartilaginous; and in all the bones the earthy elements are deficient, and an excess of soft material makes them pliant.

As time goes by, more lime compounds are deposited, the bones get harder, and they enlarge to their full dimensions. In the cranium, the “openings” fill in during the first year; and gradually the several bony parts enlarge and become interlaced at their edges, until the entire skull reaches the dimensions required by the growing brain and is immovably fastened at the seams. The bones of the spine increase their projections and enlarge their

bodies, expanding their rings to accommodate the spinal cord and extending their vertical dimensions to keep pace with the advancing stature. And thus throughout the body the bones harden in their substance and increase their size simultaneously with the development of the soft parts which they protect and support; and these changes go on with great precision, occupying stated periods of time with marked uniformity. Severe illness may retard the growth somewhat, and over-work or ill-feeding may stunt the dimensions; yet the great majority of human beings go forward in their development with precision, and complete certain stages of expansion and solidification with but limited variations as to time.

In the growth of the long bones, a spongy class of osseous formation is provided at their extremities, receiving more numerous and larger blood-vessels than the other portions of the bone. By this arrangement the elongation of these bones is peculiarly provided for. These spongy ends are called *epiphyses*; and they are distinguished from the hard shaft of the bones by their softer and more porous structure, and by an exceedingly thin layer of cartilage making a line of depression between them and the shaft. By this layer, each epiphysis is growing and is slightly separated from the body of the bone to which it belongs; the thin cartilage being the intermediate tissue which slowly changes into bone on one surface and thus elongates the shaft, while on its other surface the well-nourished epiphysis builds a new layer of cartilage. In this beautiful manner the growth of the long bones is carried forward and the stature of the frame is increased.

In due course of time, this growth of the long bones ceases. The height capable to that person is reached, and there are to be no more accessions to the bony structures. When this has been accomplished, the epiphyses no longer form new layers of cartilage; the whole of the thin layer between them and the shafts of the bones grows calcareous and ossifies; the line that has separated the spongy ends from the shaft disappears; the distinction between body and epiphysis is obliterated. At this stage, the growth of that person is finished; all bony enlargement ceases, and development is completed except as deposits of fatty tissue round out the frame. Maturity is established in the true anatomical sense when the bones, which form the basis of the system and give to it configuration, have attained their ripeness and cease to grow.

Different animals reach this completion of osseous deposit at different ages. In the stag it is finished at seven years, in the

camel at eight years, in the horse at five, in the ox at four, in the cat at eighteen months, in the rabbit at twelve months. In these and several other animals on which observations have been made, it has been found that the average duration of life is five times that consumed in growing. Individual exceptions to this are found; and yet when large numbers are taken, and they have lived under circumstances ordinarily favorable to health, the average is stated thus:

The Camel	grows 8 years;	lives 40 years.
The Stag	" 7 "	" 35 "
The Horse	" 5 "	" 25 "
The Ox	" 4 "	" 20 "
The Cat	" 1½ "	" 7½ "
The Rabbit	" 1 "	" 5 "

An evident law which attaches to the lower animals with so much uniformity, must be expected to extend to the highest of the animal creation—man. It has been established quite fully that the union of the epiphyses to the long bones is completed in man at the age of twenty years. Disease, accident, starvation, filthy surroundings and other adverse influences may shorten this time, or extend it somewhat. Fullness of stature is reached before this date, and the ripening of muscle, brain and other organs goes on for some years later; but this calculation of the date of the growth being completed, brings this finale in development to the age of twenty years. Computing the designed duration of life upon this basis, with corresponding facts in the lower animals for comparison, and the conclusion is that a healthy man or woman—apart from unavoidable diseases and accidents—is constituted to live the average term of one-hundred years.

CHAPTER III.

THE DURATION OF LIFE.

It is exceedingly pleasant to contemplate the apparent design that man should live at least one-hundred years. Instances are recorded where such an age has been attained; and some have gone considerably beyond it, retaining good physical and mental activity to the last. But these are exceptions to the average duration of life. While it seems plain that the human frame has by the Creator been fitted to exist a full century or more,

and then gradually to decline into the painless sleep of death; the circumstances surrounding mankind rarely permit such a fulfillment of the purposes of Nature. In the most civilized nations it has been computed that but one person reaches to the age of one-hundred years out of every 2000 who are born; and even this is a generous estimate.

Statistics on the death-rate of most civilized countries have been collated with care for a long time, and these in numbers sufficiently large to make them a safe basis from which to draw conclusions. These have been analyzed and presented for consideration in many different ways. Dr. Farr, Registrar-General of England, offers the following summary of facts:

"Out of every 1000 children born, 149 die on the average before the first year, and 263 before the end of five years. These numbers vary largely in different localities, in the healthy country districts the deaths per 1000 in the first five years being only 175, while in the unhealthy city of Liverpool they are 460; but the average for all localities is 263 in the first five years." His figures may be put in a table, thus:

From birth to 5th year,	263 die,	737 survive.
" 5th to 10th "	35 "	702 "
" 10th to 15th "	18 "	684 "
" 15th to 25th "	50 "	634 "
" 25th to 35th "	62 "	572 "
" 35th to 45th "	62 "	510 "
" 45th to 55th "	89 "	421 "
" 55th to 65th "	92 "	309 "
" 65th to 75th "	148 "	161 "
" 75th to 85th "	123 "	38 "

At the age of 95, but two persons survive out of the 1000; while, as before mentioned, only one out of every 2,000 born reaches the age of 100.

Similar results have been obtained in other countries where births and deaths are registered by legal compulsion. The observations, extending over a long series of years, have been estimated with great care, and every ordinary source of error guarded against. So uniform have been the results in every calculation, that the small differences scarcely affect the tabulated figures of Dr. Farr. All show the first five years of existence to be eminently dangerous, followed by a steady diminution of fatality till after the age of puberty. Middle life gives a rather uniform rate of loss, 500 out

of the 1000 having died in a few months after the forty-fifth year. After the fiftieth year, the rate of loss is increasingly great, remembering the limited number out of the thousand which survive at that age. With but 309 of the 1000 living at the end of the sixty-fifth year, no fewer than 148 of these (nearly one-half) die in the next ten years. At the age of 70—the date that the Psalmist's observations fixed as the common limit of life—only about 210 of the 1000 remain; and two-thirds of these pass away before they reach the four-score years.

"The mean annual death-rate for the whole of England and Wales during the ten years, 1861-70, was 22.4 per 1000; but it need hardly be said that it varied very considerably in different localities. Thus in fifty-four healthy registration districts the mortality was at the rate of only 17 per 1000; and in a few it was as low as 15. In another series of districts it was 19; and gradually increasing (pretty much according to density of population) to 23 and 26, it reached in Manchester a rate of 37.5, and in Liverpool it reached the enormous rate of 38.6 per 1000." At one time the Liverpool district gave a rate of over 40 per 1000.

In our own country the annual death-rate corresponds pretty closely with that of England. Registration in rural districts is scarcely practiced; and some of these districts—as malarial sections and stormy exposures—are so much more unhealthy than others, that it would be difficult to compute an average death-rate. So far as data have been obtained for reasonably accurate computation, they give in the healthy rural sections of the United States an annual mortality of but a fraction over 9 per 1000, while in unhealthy country localities it ranges from 18 to 24 per 1000. In large cities, this death-rate differs considerably according to density of population, natural healthfulness of site, public sanitary regulations, etc. In Boston and Baltimore, a series of years give a death-rate of about 20 per 1000; Cincinnati and Philadelphia, 22; St. Louis, 23; Chicago, 24; New Orleans and Charleston, 27; New York, 25. Special epidemics and the movement of population have a distinct bearing on these figures some years, but the average has been given as nearly as possible at this time. An average of 20 deaths per year, for town and country, to each 1000 inhabitants, is favorable. In England, for a period of more than twenty years the annual average was 22.2.

Contrary to general opinion, the death-rate among females is less than among males; except from between the ages of 18 and

35, the child-bearing period, when that of females is slightly greater. Taking all ages, from 1 to 100 years, the registration of England and Wales gives an annual death-rate per 1000 of males, 23.3; of females, 21.5. For the first five years of life, the difference is considerable, being 72.6 for males, 62.7 for females. From 35 to 45, the rate between the sexes is nearly balanced; but after 45, when woman's duties as a mother cease, the ratio of loss is greatest among males, steadily increasing each decade up to the eighty-fifth and ninety-fifth year, when the table of this decade stands 305.5 deaths of males, 279.5 of females. United States reports, though not so extensively and thoroughly collated as those of England, show nearly the same ratio; while France, Austria, Prussia, and other European countries vary but little from England.

While all these tabulated conclusions are still subject to correction, they are believed so nearly to approximate the real facts that the estimates for rates in Life Insurance are based upon them. Insurance companies estimate, from such data as the above, the number of years that a person of a given age may expect to live. This is called "expectancy of life." It differs somewhat in different countries, because the death-rate is higher in some countries than in others. Thus, in England and Wales, as above noted, the annual death-rate is a fraction over 22 per 1000 inhabitants of town and country, in Denmark and Sweden it is a small fraction above 20, in France 24, in Prussia 27, in Spain 29, in Italy 30, in Austria 32. In these different countries, therefore, the estimated "expectancy of life" will decrease in years according as the annual death-rate increases. The actual experience of such companies accords very closely with the "estimated expectancy" made on the above data. Accepting only persons in good *present* health, free from hereditary taints and from all intemperate habits, the best New York offices give the following: Such a person at the

Age of 10 years, may expect to live 52.03 years.

"	20	"	"	"	"	44.99	"
"	30	"	"	"	"	37.59	"
"	40	"	"	"	"	29.93	"
"	50	"	"	"	"	22.23	"
"	60	"	"	"	"	14.96	"
"	70	"	"	"	"	8.80	"
"	80	"	"	"	"	4.39	"
"	90	"	"	"	"	1.87	"
"	95	"	"	"	"	1.19	"

Some live beyond this average, others not so long; but these "expected" years of continuing life are estimated on thirty years experience. It shows a rather better expectancy in the United States than in England. The chances are decidedly more favorable to the married of all marriageable ages, than to the single; and the expectancy of life diminishes as the number of inhabitants to a square mile increases.

These dull, cold facts as to the annual mortality, the average life of man, and his rational expectancy at any given time, are in painful contrast to the seeming law that man should live at least one hundred years. When we search for the causes of this premature mortality, they are not difficult to find. The ordinary accidents of life take off a small number; the influences of climate and the seasons and the soil are fatal to a larger number. But man is continually contravening the laws of health and life; and by acts which are in opposition to what God has ordered for the welfare of his own frame, man works his own physical decay and death. While much that is deleterious is beyond human control, the facts are most clearly established that the chief causes of disease are of our own making, and the larger number of premature deaths could be prevented,—enabling us to reach at least well toward the allotted century of life.

So large a proportion of deaths results directly from causes within human control, that a number of the most dangerous maladies are now classed as "preventable diseases." This is notably true of typhus and typhoid fevers, cholera, small-pox, scarlet fever, and other infectious disorders. The first two of these are so constantly developed in their severer forms under circumstances of local and personal uncleanliness and over-crowding, that they have been designated as "filth diseases." Instances of their terrible ravages are oftenest found in jails, ships, camps, tenement houses, and similar places, where the number of persons greatly exceeds the provisions for ventilation and pure water, and where removal of excreta and purification of the surroundings are almost neglected. But when proper measures of purification are adopted, the very localities where these maladies had returned virulently at intervals, become free from their visitations.

Cholera is also conveyed by impure water and among the unclean classes chiefly; and may almost be prevented by timely purification. Diarrhoea among children in cities is greatly lessened by drainage. Small-pox and other eruptive diseases may be

effectually "stamped out" by rigid measures of isolation and cleanliness. Consumption may be curtailed in the number of its victims by thorough drainage and proper home ventilation; and the general death-rate of a locality may be greatly lessened by the adoption of those modes of public and private sanitation which science teaches and which are so simple in application. A writer has said: "The saddest pages in the history of all nations, are those which treat of the wholesale sacrifice of human life through ignorance or neglect of the simplest means of preserving health or averting disease."

Evidences of the benefits to be obtained from a proper regard of the means of sanitation, are very numerous and decided. Three and four centuries ago, the houses of the masses of Englishmen consisted of dark hovels with mud floors and thatched roofs; city streets were narrow, unpaved, without sewers or drains; country flats were undrained; personal cleanliness was neglected, gluttony and intemperance abounded, and filth accumulated everywhere. Under such circumstances, disease was rampant, the Plague and the Black Death swept off their victims as by a besom, the annual death-rate in London was 80 out of every 1000, and a human generation was less than 26 years. Two centuries ago, after the great fire of 1866 had purified London, and personal cleanliness and municipal regulations began to be regarded, the death-rate of London was reduced to 50 per 1000, and a human generation extended over 30 years. At the beginning of the present century, the improvements made in modes of living and habits of personal care advanced the duration of a generation to $33\frac{1}{3}$ years. At this time, under the excellent progress made in the various departments of public, domestic and personal hygiene, the length of a generation in Europe and America is over 40 years. This means a reduction of the annual deaths by several millions; and the average duration of life could undoubtedly be extended much beyond the 40 years, were the general and special laws of health better understood by all, and more carefully obeyed.

Dr. Mapother, in his Dublin lectures, cites the gains made by suitable preventive measures in several cities. "In 1842, one-third of the laboring population of Liverpool lived in cellars about twelve feet square, sometimes less than six feet high, often without windows, and only lighted and ventilated by a door frequently below the level of the street. Its death-rate was 38 per 1000 in 1846. But up to 1864, under a system of improved sewage,

closing of cellars, preventing over-crowding, and separating contagious cases, the death-rate had been reduced to 24. This is less than two-thirds the former rate; and thus it may be estimated from the population of that city that 4,000 lives have been saved annually."

In Macclesfield, as shown by Lord Shaftesbury, the death-rate had been 30. After the Board of Health began its sanitary labors, this rate was reduced to 24 through five consecutive years,—a saving of 1,015 lives, and of 28,420 cases of sickness.

Dr. Thomas B. Curtis, of Boston, alludes in Dr. Buck's "Hygiene," Vol. II., to Dr. Buchanan's elaborate inquiry into the sanitary condition of English towns: "The towns were twenty-five in number, containing together an aggregate population of 606,186 inhabitants. Their sanitary condition and their mortality rates for many years had been carefully ascertained. The [public] sanitary operations effected were of various kinds, comprising (1) Drainage works, affecting surface, subsoil and houses, (2) Improvements in water supply, (3) Measures for the removal of decomposing organic matters, (4) Improved paving, scavenging, and public cleanliness, (5) Amendment of lodging houses and suppression of over-crowding. Several years having elapsed since the completion of the improvements, the mortality returns were compared with those of years preceding, [with the following results]:

TOWNS.	Death-rate before Construction of Works.	Death-rate after Construction of Works.	Reduction of Typhoid Fever Per cent.	Reduction of Phthisis. Per cent.
Danbury, - - - -	23.4	20.5	48	41
Cardiff, - - - -	33.2	22.6	40	17
Croydon, - - - -	23.7	18.6	63	17
Dover, - - - - -	22.6	20.9	36	20
Ely, - - - - -	23.9	20.5	56	47
Leicester, - - - -	26.4	25.2	48	32
Macclesfield, - - -	29.8	23.7	48	31
Merthyr, - - - - -	33.2	26.2	60	11
Newport, - - - -	31.8	21.6	36	32
Rugby, - - - - -	19.1	18.6	10	43
Salisbury, - - - -	27.5	21.9	75	49
Warwick, - - - -	22.7	21.0	52	19

"In these twelve towns, the mean death-rate was lowered from 25.6 to 21.7 per 1000, [a yearly saving of over 2,400 lives]. The diseases in which the greatest reduction was effected were typhoid fever, phthisis, and diarrhoea. The results in regard to phthisis

afforded a remarkable confirmation of the law discovered in this country by Dr. Bowditch, that dampness of soil is one of the chief causes of consumption."

In nineteen English towns, whose mortality rates were studied with reference to the effects of thorough public sewerage and a proper supply of pure water, Dr. Buchanan found the total reduction of the death-rate to be 10.5 per cent. In typhoid fever this lowering of the rate was most marked, being 45.4 per cent. in the total mortality from this disease. As to cholera epidemics, he considered that they had been made "practically harmless." Soyka has furnished some German statistics on this point, referred to by Dr. Parkes. In Hamburg, out of each thousand deaths the number from typhoid fever used to be 48.5, but has been reduced to 10.5; in Dantzig it was 26.6, but now is 2.3.

In the United States, the most careful estimates show that, through a long series of years, the loss of life from diseases that could easily be prevented is not less than 100,000 each year. This is the number of deaths that would be absolutely unnecessary under a proper observance of the laws for preserving health. Along with them there no doubt occur, each year, 150,000 cases of sickness which are also preventable and therefore unnecessary. The pecuniary loss in time and business incurred by such a vast and needless waste of health and life, would certainly aggregate \$100,000,000 to the public; and \$50,000,000 more to the afflicted families. The suffering and sorrow inflicted by such needless sickness and death, are things not to be computed.

It is impossible to "add to one's stature," when once the fullness of stature has been attained; but it is easily possible to improve one's stock of vitality and to strengthen its hold upon the structures (p. 12). The means consist in obedience to the laws that govern vitality, in conforming one's daily habits and surroundings to the rules by which vital acts are promoted. Obedience, practiced with care and system from infancy onward, gives the highest development to each organ, prepares every tissue for the fullest activity, establishes the firmest constitution, prepares the frame for the most effectual resistance to disease, and qualifies it to retain its tone and recover rapidly when unavoidable diseases do assail it. Men have shortened the average duration of life through disobedience to those laws; and pay the penalty (which can never be escaped) in multiplied diseases, feeble resistive power to these diseases, increased mortality, and a curtailment of the average

duration of life to about one-third of that century which was apparently designed by the Creator.

Every consideration of ease, comfort, happiness, vigor, health, and long life, invites our obedience to vital laws. These laws are not yet fully understood; but very much is already known, and other problems in the list are undergoing solution. Most gratifying results have rewarded obedience to what is now understood. When simple measures of public sanitation reduce deaths from typhoid fever by 40 to 70 per cent., and lessen the ravages of consumption by 11 to 60 per cent., and make cholera almost harmless, the incentive to increased observance of public and private hygiene is very great.

"To what extent the prevention of disease, the prolongation of life, and the improvement of the physical and mental powers in man may be carried, we do not know. . . . But it is clear that the average length of human life may be very much extended, and its physical power greatly augmented; that every year within this commonwealth thousands of lives are lost which might have been saved; that tens of thousands of cases of sickness occur which might have been prevented; that a vast amount of unnecessarily impaired health and physical debility exists among those not confined by sickness; that these preventable evils require an enormous expenditure and loss of money, and impose upon the people unnumbered and immeasurable calamities, which might have been avoided; that means exist within our reach for their mitigation or removal; and that measures for their prevention will effect more than remedies for the cure of disease." (*Boston Health Report*, 1850).

Where so much that is precious to all men is proffered as the result of sanitation, it seems strange that any person or any community would fail to strive for so great results. Various influences account for the apathy that exists on these matters. Communities may see no *immediate* danger; and defer measures of hygiene until the destroyer is upon them. Public debt may deter active work when there is thought to be no pressing need of it, till presently it is realized that the general loss from delay is many times greater than would have been the total first-cost of improvements. Individuals are too often inclined to consider themselves beyond danger, and to boast of *their* immunity where others have suffered, —a species of presumption that compels a future payment of Nature's claims, with compounded interest. Many are offended at an intimation that they or their families are not living in the best

manner, or that their premises are not clean and in good order. Others have pet theories and methods of their own,—“views” that they are determined to pursue despite all scientific teachings to the contrary, hobbies that they are in self-conceit bound literally to ride to the death. Very many more are totally indifferent in the whole matter; or imagine that hygienic measures are burdensome and inconvenient, instead of being simple and pleasurable; or desire to do something sanitary, but are totally ignorant of what to do, fall into the wrong way, and become disgusted with all hygienic directions. I shall aim to give such information on these subjects as will be plain to every person who wishes to understand, and may be followed in confidence of its promoting health and favoring the prolongation of life.

CHAPTER IV.

A HEALTHFUL HOME.

THE situation of one's residence, and the soil upon which it rests, have a material influence upon health. It is not always possible to control the site, and towns and cities are located rather by the conveniences of commerce than the demands of sanitation; but there are a number of considerations in this connection that should determine the position of the home when practicable, and serve as rules for its protection at all times.

All soils contain air, water, and organic matter, the amount and proportions differing. Air extends to a depth varying from two to twenty feet or more, and is commonly called “ground air.” A large portion of this consists of carbonic acid gas, the amount of which is very greatly in excess of what is present in the atmosphere. This is in part derived from the air, but in larger part from decaying vegetation in the soil; and the per cent. increases from 1.58 in 1000 near the surface, to 18 or 20 at a depth of ten to twelve feet. Other gases, the results of decomposition, may also be present; and these may extend to notable distances in alluvial, sandy and other porous soils.

Kitchen slops thrown upon the ground near the house, leaking sink-drains and sewers, refuse heaps, garbage accumulating and decaying in the cellar, and similar sources of gaseous eman-

tions of impure character, may combine with the ground air their offensive products of decomposition. Family vaults, marshes, and in some instances graveyards, have mingled their gases with the ground air and traversed the soil throughout a neighborhood. In London, Paris, and other large cities, cellars in the vicinity of cemeteries have become so filled with these impure gases that a candle would not burn in them; severe sickness and heavy mortality prevailed in those houses till the graves were emptied and purified. Burial within the limits of cities is on this account no longer practiced; and such facts illustrate the power of the soil to accumulate and then distribute the polluted gases of animal decay. Heat in the house causes such gases to rise upward as by suction, and to permeate every room. A house, therefore, should not be subjected to such possibilities of impurity from slops, vaults, or other decaying substances.

"Made" ground in cities is often a source of deleterious emanations. A low spot, a ravine, an arched-over rivulet, is brought up to a certain grade by filling; and too often the materials dumped in include kitchen garbage and bones and grease, and probably a dead fowl or cat or dog now and then. Such materials, scattered through the earth and ashes used in making the "fill," slowly decompose and gradually disseminate through the soil their gases of decay. To a certain extent, and this a limited one, the earth and ashes retain these gases; but when the "made" ground gets saturated with them, they rise and mingle with the air of cellars and creep up through the houses. A fill ten to twenty feet made up in part of such vegetable and animal waste, may show a persistent damaging influence on families living above it for ten or twenty years, or even more.

Water is present in all soils. At varying depths, from ten to a hundred or more feet, it fills all the interstices of the soil, and moves slowly toward a river or other body—traveling from five to twenty feet an hour, according to the nature of the soil and the declivity. This is called "ground water." Above this lies the "surface water," partly saturating the earth and mingling with the ground air. The level of the "ground water" may remain nearly stationary, or may rise and fall during heavy rains or droughts—being permanently nearest the surface in marshy lands and stiff clays. "Surface water" commonly exists to the extent of 25 to 30 per cent in 1000 parts of clay lands; 10 to 20 in limestones; 30 to 35 in sandy loam; 40 in black loam. In quite pure sands

there may be but 4 or 5 per cent., and in granite soils the amount of this surface water is less than one per cent.

Both surface and ground water exert an influence on the healthfulness of the house. Moistness hastens the decay of organic matters, and imparts chilly dampness to the house. In marshy sections and in alluvial soils, malarial diseases are thereby increased; and a damp or really wet cellar to a house decidedly promotes neuralgias, catarrhs, rheumatism, consumption and throat troubles. A soil with a considerable amount of permanent surface water, is prolific of consumption: and no sanitary fact is better proven than that such sections give a high mortality rate in this dread class of maladies. Thus it is frequently noticeable that the houses of farmers in the open country, where fresh air and sunshine are expected to secure the fullest vigor, have under them a stiff clay subsoil near the surface that keeps cellar and house constantly moist and chill; and families in such homes are much afflicted with rheumatism and catarrh, the females drooping with poor blood and neuralgia, consumption and other pulmonary diseases.

Impure surface water also greatly affects wells, and thus gives entrance of deleterious substances to the system. If it do not wash into wells the solid elements of kitchen slops thrown upon the ground near by, and of family vaults and other offensive spots, it dissolves portions of these and absorbs the gases of their decay, and thereby taint is given to the family drinking supply. It is revolting to think of disease being imparted from such sources, but the facts are patent and cannot be gainsaid. Maladies arising from these sources are usually spoken of as "filth diseases," including typhoid and typhus fevers; and they are so answerable to sanitary regulations and human control, that they are rightly considered as preventable maladies (p. 22). Further consideration will be given to this subject in the chapter on water supply.

No soil is free from the presence of organic matters, due to vegetable growth upon the surface; to minute vegetable and animal substances carried down from the atmosphere by rains; and to such substances carried from distances by winds and floods, and left to settle in low places. Sands, alluvials, light clays, heavy clays, and all other soils, contain such elements in varying degrees and in process of slow decay. Light and porous soils allow the wash of these materials to considerable distances by the surface and ground water; and old and thickly populated districts are liable to have the

soil thus charged in their neighborhood, and even quite beyond. By these substances the water supply may be injured, and the location rendered harmful by the gases rising into the cellars and then permeating the houses.

These several classes of facts should receive due attention in seeking for a healthful home. While they will not always assert their bad influences at once, these will make themselves felt sooner or later; and such influences will not be the simpler or more trifling because delayed, but may be all the more severe from having undermined the health extensively before fully asserting their powers by the overthrow of the constitution. In many localities they may be altogether avoided; in many others they may be overcome by a good system of underdrainage admitting pure air into the soil to oxidize decaying material and remove noxious gases, by a proper disposal of excreta and sewage, and by other sanitary measures. Where such measures cannot be made readily effective, because of the impossibility of drainage or by the perpetual excess of decaying substances keeping the earth super-saturated with noxious elements, the locality is wholly unfit for human habitations. Some marshes with the "ground water" always close to the surface, and which cannot be freed from malarial poison by drainage or cultivation, render a large area of the adjacent territory unsuited for the residence of any man who values the health of his wife and children. The enfeebling and varied sicknesses, and inevitable deterioration in constitutional vigor by which the entire family becomes extinct in two or three generations, is the too fearful price that must be paid by those who remain in such regions. A place of sepulture in crowded condition, especially in porous soils, is objectionable in the highest degree to any neighborhood.

When obtainable, a moderately porous soil with a sand or gravel bed beneath, is most desirable. A rocky bed below is admirable, if the rocks are dipped somewhat; but perfectly level stone strata below the surface, as in limestone beds of moderate thickness, with clay between the strata, commonly admit of but poor drainage, and invite fogs by their wetness. Granite, open sandstone, and chalky formations are among the best soils. A stiff clay earth is not inviting; and a "hard pan" clay forming a dense stratum approaching within a few feet of the surface, is always cold, wet and disadvantageous. A strongly sandy soil retains most heat, a clay soil least; whence a sandy position should be cooled by trees and vines and shrubs somewhat near the house, while a position on clay needs to be left more open to the sun.

It is desirable to keep away from marshes, narrow valleys, the foot of steep hills, and other places that accumulate large amounts of vegetable debris, and favor heavy fogs, and interfere with the free circulation of air. In high latitudes it is also advisable to avoid elevated positions, which are too much exposed to strong winds; and on level places a good wind-break a little to the west and north should be made to protect the house and save its inmates from serious pneumonia, bronchitis and acute rheumatism.

Provision should always be made for effectual underdrainage; for a house with a wet or constantly damp cellar is always objectionable, and may prove destructive to the family health. In a district where there is any tendency to malaria, such a cellar greatly promotes such diseases; at any time or place it slowly lessens the general power of resistance, and causes the frame to yield more easily to all diseases; and, as already stated, the moistness gives to the house such a chilled atmosphere as inclines to rheumatism, catarrh, neuralgia, pneumonia, and especially consumption. In Massachusetts it has been very thoroughly proven that reducing the wetness of a soil by thorough drainage has greatly reduced the mortality from consumption, (see page 23). Extensive examination of this subject led Dr. Bowditch to the conclusion that "a residence on or near a damp soil is one of the primal causes of consumption;" and this was subsequently verified by Dr. Buchanan, again by Dr. Simon, and now is accepted as the fact in all parts of the world. What is true of communities is equally true of each family making up those communities; hence a wet or persistently damp cellar should not be dwelt over if it cannot be thoroughly corrected.

"Of all the physical qualities of the air, humidity is the most injurious to human life; and therefore, in selecting situations for building, particular regard should be had to the circumstances which are calculated to obviate humidity, either in soil or atmosphere, in every climate," (Dr. James Clark). Drainage, when properly made, helps greatly to remedy this evil condition, at the same time admitting to the soil a free circulation of purifying air. A cellar should at all times be drained thoroughly; and often it is necessary to build a drain outside of the house, entirely around it, and deeper than its foundations. A drainage-well *in* a cellar, even though it reach to a gravel bed below the clay, cannot make a dry house. Brick foundations are thoroughly bad, a single brick holding not less than a full pint of water; and the bricks of a brick house should never reach the ground, nor come down low enough

to receive the splashings of rain or the wet of melting snows. "Made" ground in a city should not be built upon in less than three years, even when the fill is of porous materials and the escape of ground-water is excellent. Where the fill is of compact or clayey earths, and contains a considerable amount of organic refuse, and the position or surroundings are calculated to keep it wet, the fitness of that ground for human residence will be a question in a very indefinite future.

Light—sunlight—glorifying and purifying every room in the house a reasonable number of hours each day, is an imperative requisite to a healthful home. Potatoes cannot bloom in a cellar; roses cannot unfold their loveliness when tied up in a shawl and sunbonnet. Human beings cannot develope vigor in dark rooms, whether that darkness be caused by a narrow street, an adjacent brick wall, tall overhanging trees, or thick curtains and closed shutters. The business man in a dull office, where gas at noonday takes the place of the sun that never enters, grows thin, cadaverous, bald, nervous, dyspeptic, and possibly takes stimulants to goad up the vigor that the sun should secure. Women and children living in dark rooms lose the fresh color from the cheeks, become pale and listless, lack digestion and energy, grow into feeble and fretful bundles of dyspeptic nervousness. Woe to the digestion, and heart, and lungs, and sleep, and blood, and nerves, and good temper, and general happiness of people who live in houses not properly lighted up by the sun in every room and closet and corner. Many a drooping patient, lingering in a species of hopeless convalescence, grasps life with a new hold and immediately starts eagerly on the road to recovery, by being changed from a dull room or house to one that receives a daily illumination of sunshine. Dark air is lifeless air, and is akin to the cemetery and to death.

In cities it is often difficult to obtain houses that have every room daily lighted by the sun. This fact is a great detriment to the health of those living in cities; and municipal authority should regulate the building of dwellings with reference to light, as it now regulates them with reference to sound walls, sanitary plumbing, clean vaults, fire escapes, and other necessities for human safety. Persons looking to the health of their family in a city, should never occupy a dark house, or live in a narrow street.

In the country, plenty of sunshine can be obtained; but sometimes it is shut out, and the atmosphere made heavy with dampness,

by having too many trees and vines growing too closely to the building. Beautiful residences on lovely sites are sometimes made dismal and unhealthful by an excess of trees and foliage. I know some delightful suburban villages, where culture and wealth have done everything to beautify the houses, but where all has been spoiled by trees and shrubs being planted too closely to the houses and too thickly, and not a healthy woman or child can be found in these communities. I have known persons seriously threatened with consumption, living where some favorite trees darkened the chief rooms, at once improve and entirely escape by promptly cutting down those trees. Better sacrifice any number of choice trees, than have the sun excluded from any room in the house; better apply the ax vigorously, than have the grounds made dull and damp and chill with heavy shade. Human life is more beautiful and precious than vegetable life. The very cellar should receive a share of sunlight.

But while this need of sun is absolute for the completion of the bodily functions and maintenance of health, it is possible to fall into the opposite extreme and thereby work mischief. This is many times observed about new residences in town and country; and especially throughout our own Western States, where small houses are erected hurriedly upon a soil that heats rapidly during the day and cools rapidly at night. No trees are near to give the house a friendly shade, no swift-growing vines trained about the windows, no shutters provided to shield against the mid-day glare. From morning until night, the sun beats upon the thin-walled house, fills it with an unshadowed brightness that is oppressive, and perhaps is reflected in tiresome whiteness from plastered walls. Such unbroken fierceness of sunshine is fatiguing to unrested eyes, drying to muscles and nerves, wearying to flesh and blood. A house thus exposed to the intense dry heats of our American summers, becomes hot through its wood and plaster, remains heated during most of the night, and acts as a sort of oven upon the inmates. Its influence is oppressive through all the summer months, and cannot be rallied from till the cold weather has well advanced. Women and children, who are in-doors more than men, become pale and relaxed and drooping,—weakening and wilting under a steady heat-stroke against which they can find no relief as the weary days go by. Serious nerve troubles and bowel diseases are the more common results, and weakened or inflamed eyes are also frequent.

Such new houses should be protected by porches on the more exposed sides, by shutters, and by vines that will grow rapidly and can be trained as partial screens a few feet from the windows and along the porch fronts. A modifying tone should also be given to their bare walls by at once covering them with paper of neutral colors, which are soothing to the eyes and nerves of those occupying the rooms. Then rapidly growing trees should be planted, especially on the south, east and west exposures—such as will soonest afford some friendly shade, and at a distance that will intercept the sun's rays in a measure while permitting their direct entrance into the rooms for some hours in the day.

Ceilings should be of sufficient height to secure a fair circulation and coolness in summer, and to provide a goodly body of air to each room in winter. Small rooms with low ceilings never can be made properly healthful,—in summer getting too hot; in winter being heated and cooled too suddenly, and not allowing necessary ventilation without the greatest danger of causing direct draughts. A proper allowance of fresh air for each adult is about 3,000 cubic feet an hour. It is not possible to maintain the air of a house absolutely pure day and night; but a moment's reflection on the large amount of air needed in a room with closed doors and windows, occupied by from two to four persons, will suggest the importance of having all rooms of goodly size, and then providing for a suitable air-supply by ventilation. No economy is so great a loss, as that which stint a few dollars on the size and light of a room. Have fewer rooms, but get enough air.

Nine to ten feet is a sufficient height for rooms of average dimensions on the first floor; eight to nine on the second floor. A ceiling of thirteen or fourteen feet is wearisome to women who have to travel up and down stairs many times a day. Such houses, as also houses where the risers in the stairs are high, (over seven and a half inches) and the tread narrow (less than ten and a half inches), frequently cause severe backaches, spinal tenderness, prolapsus, and other troubles. In cold climates, rooms of such height cannot well be heated evenly. Upper rooms should never be finished directly upon the rafters, as they get much overheated in summer, and become as so many ovens to toss in during the greater part of the night and prevent rest until near the morning. Such rooms waste the strength even of the hearty farmer; and promote cholera infantum among children and severe bowel troubles in adults. An air-space of two or more feet between ceiling and

rafters, should be provided. The half-story made by finishing the upper part of many country houses, is exceedingly objectionable from the standpoint of health; and one of the most commendable features of the modern style of architecture, is the large air space above the rooms that is secured by the steep roofs. No house should ever be built directly upon the ground, but the first floor should be from two to three and a half feet above the surface.

CHAPTER V.

ON HEATING A HOUSE.

DURING several months of the year, in the larger part of the world, health and comfort require that warmth in the house shall be provided by artificial means. Heating and ventilating are mutually related; and no methods for warming a house can be correct unless due regard is in connection therewith paid to its ventilation.

People differ as to the amount of heat they wish, but it is safest always to keep the rooms as nearly as may be from 62° to 65° Fahrenheit, during the day,—or an average of 63° . Most American families accustom themselves to an average temperature of 70° . The point for taking the temperature of a room should be at about four feet from the floor, and far enough from the stove or register to represent the general state of the room fairly. A small thermometer used as a guide, is a good piece of economy, as by it the members of the family who are in-doors most of the time will be kept from unconsciously over-heating the rooms; the more robust when they come in from vigorous out-door action, will be checked from making an outcry about the terrible heat of a room that to the others is barely warm enough, and also be prevented from hastily throwing open doors and windows, and thus suddenly lowering the temperature and creating draughts that might be serious to the women and children in the room.

The temperature of a sleeping room should not be above 50° or 55° ; and for healthy adults may be allowed to fall gradually to 45° or 40° during the night. Unless through the stern force of necessity, no one should sleep in ice-cold chambers, where water in pitchers will freeze and the breath form ice on the covering. Vigorous people inure themselves to such sleeping apartments, and feel no

detriment therefrom; but to women, children, and old people, such bedrooms are sources of much danger, frequently proving the origin of bronchitis, pleurisy and pneumonia. If good health and long life are to be preserved, let no hot-blooded husband and father attempt to "harden" his wife and little children to freezing bedrooms, or insist on their going to such from a warm and perhaps over-heated sitting-room. Provide carefully for a mild warmth to every sleeping-room as a saving of health and prevention of sorrow; yet avoid all high heats and oppressive closeness of air there. During sickness, an average temperature of 60° is best, ranging two or three degrees above that for bronchitis or pneumonia.

A house should also be somewhat evenly heated throughout, or kept at a moderate point in the apartments least used. A strong heat in a room, with hall and other rooms thoroughly cold, causes too many fluctuations of temperature to persons going from one to the other. Most members of the family will be kept rather miserable through the winter months, by having one "cold" follow another in perpetual succession; and may establish thereby a wretched catarrh that may continue for years. A house with a hall well heated imparts a pleasant warmth to all the rooms, and the chief living rooms can then the more easily be kept at the average temperature of 63°.

Hot air rises, and so leaves the cold air of a room nearest the floor. And this heat does not readily distribute itself through the atmosphere, but remains unequal in degree in the upper and lower strata unless distributed by the creation of air-currents in the room. In a school-room with a ceiling of sixteen feet, heated by a stove and exposed on two sides, with the thermometer out-of-doors standing at zero, a Canadian observer (Ruttan) found a difference of 4½° in the temperature, for every foot in height. The same gentleman, in a basement room heated by a stove and having a cold cellar beneath, repeatedly saw water freeze upon the floor while the heat at the ceiling was 100° F. Such differences are too great for comfort and are severely taxing to the health, almost freezing the feet while heating the head. Children playing on the floor, get the coldest of the room; and parents frequently wonder how and where their little ones "get such dreadful colds," when the innocents are most of the time blue with chillness because proper measures have not been taken so to distribute the heat that it shall reach the floor. Children sleeping in a low bed often suffer seriously from the same cause. Such inequalities are not overcome

by tightening the doors and windows with extreme care, so as to prevent the escape of heat and economize fuel. That merely ensures the greater heating of the upper parts of the room, and prevents the ingress of those minute currents which would in a measure help to create distributing air movements in a room; and it is such an effectual bar to ventilation, that nothing but supreme folly could lead any human being thus to make his house almost as air-tight as a coffin.

The great majority of families must continue to warm their houses by the use of stoves, as being altogether the most rapid and economical in action. But stoves are most liable to over-heating, to interfering with that removal of stale air and replenishing fresh air necessary to existence, and to causing variations in the heat of lower and upper strata. Yet stoves need not become sources of such varied damage, if proper judgment be exercised in their selection and use.

A stove should be so large compared to the size of the room as to be capable of using enough fuel to supply the needed warmth in the coldest weather, without urging the fire to a point liable to bring the metal to a red heat or near that heat. A metal surface heated to redness burns the minute dust and organic particles in the atmosphere, rapidly consumes the vitalizing portions of the atmosphere (oxygen), and so expands the particles of the metal as to enlarge the minute interstices between these and leave the gases of combustion to escape from within the stove into the room. Headache, vertigo, and sense of oppression are the direct results. Where the metal itself is thin, as in sheet-iron and the "cheap" cast-iron stoves now so common, it is difficult to avoid bringing the surface to redness in real cold weather; and such stoves permit the free escape of gases in large quantities long before the point of redness has been reached. Such high heating also expands the plates, causing them to warp and to enlarge the joints, making so many more and greater openings for the escape of gases.

No piece of economy is more unadvisable than buying a stove too small for easily heating the room it is intended for, and of the thinnest available metal because of "cheapness." A single case of severe illness induced by its alternately rapid heating and cooling, and by its gaseous poisoning of the atmosphere, would pay several times over for a large and suitable article that would be a comfort to the whole family. In Germany and Russia, they obviate these difficulties by using large stoves made of tiles or other form

of brick-ware. By these, all gaseous percolations are made impossible; and the heat obtained cannot be raised to an immoderate degree, and they retain warmth so long that a mild temperature is maintained through the night. These are admirable qualities; but the great bulk of such stoves will prevent their use in American houses, though finely adapted to halls and schools. In a measure they are imitated by the use of fire-brick in the fuel chamber or fire-basket of many of our better stoves; and a lining of this kind is excellent, and really should never be omitted in cooking or heating stoves designed for burning either bituminous or anthracite coal.

An open fire in a grate is the most cheerful of all fires, and will never cease being attractive and a favorite. As a means of obtaining warmth, however, it has several decided objections. It wastes fuel rapidly, the best grate yet constructed yielding to the room not more than fifteen per cent. of the heat evolved by the fuel used, the remaining eighty-five per cent. going up the chimney. It heats the room very unevenly, almost scorching the faces of those sitting near it while their backs are shivering; and the remoter parts of the room cannot be made reasonably comfortable in very cold weather. It is understood that an open fire is a valuable means of ventilation, and this is in a measure true. It carries off the lower strata of the air, but cannot to any material extent influence the upper strata of a closed room; so that impurities accumulate at the height of the mantle-shelf and above. At the same time an open fire causes draughts to sweep over the floor and the lower parts of the room, while the air above the mantle moves but very little. Such inequalities are not good for health, under any circumstances; and children are made very uncomfortable by such draughts, the cold air filtering in rapidly by doors and windows and keeping the little ones too chilly. When the halls of a house are well heated by stove or furnace, a small fire in a grate then gives a room the desired look of cheerfulness, ventilates by introducing from the hall a current of warm air rather than cold, and is in every way comfortable and desirable.

Furnace heating is a good mode of securing general warmth to the house economically. It is very liable to be pushed to excess, making the atmosphere too dry for lungs or for furniture, super-heating too frequently, and generally consuming the oxygen by using a furnace entirely too small for the purpose and then urging it till its surface is kept at a red heat most of the time. Unless a furnace is extra large, its own air-supply of the purest quality

from out-of-doors and not from the cellar, and great care be taken to prevent over-heating and dryness, it will prove an exceedingly bad method for warming a house. Immense detriment follows from the use of this mode of heating where such precautions are not carried out rigidly,—detriments that are slow and insidious, but none the less certain and undermining. But when proper watchfulness is exercised in these things, furnace heating is desirable; and may be improved upon by using a wrought-iron furnace, which is much better than cast-iron for either furnace or stove.

Various methods of steam-heating have been devised, and are excellent. A chamber with large pipes filled with steam or hot water from a boiler, and heating a body of air slowly passing through it from the outside to the halls and rooms above, is altogether the most perfect means for obtaining warmth. It can never superheat the atmosphere; and it distributes through a house a *very large body of air heated to a moderate degree*, which is the greatest desideratum in all provisions for artificial warming. While its first cost is considerable, its final expense is moderate considering the general comfort it brings, and persons owning their own homes will find this to be in all respects the most healthful and desirable mode of heating.

A due supply of moisture in the atmosphere of a heated room is an imperative necessity. Lungs can not do well and maintain healthy tone in an over-dry atmosphere with repeated fluctuations of temperature. It is true that sections of our country, as Arizona, give a high range of summer heat with very little humidity in the air, and the lungs do not thereby suffer; but the heat changes there are far from being sudden, the thermometer scarcely falling below 80° at night for many weeks in succession, and the going in and out of rooms and houses makes very little difference in the kind of atmosphere breathed. This evenness is greatly unlike the conditions of great variability in a hot and over-dry room in a northern climate in winter, in which the air that is too heated is also quite sure to be impure from insufficient ventilation,—the different rooms of the house being at the same time of different temperatures, and these again different in warmth and moisture from the outer air. The breathing apparatus is weakened by such dryness; and the nervous system becomes enfeebled and disturbed, as it also does in very dry sections of our country.

The amount of humidity necessary to the best health is not absolute, and may fluctuate through a considerable range. As air

is heated, its capacity for moisture increases. It is far from being desirable that this capacity be fully satisfied, *i. e.*, saturated with moisture to its utmost power of receiving. For instance: At the freezing point, 32° F., a cubic foot of air is saturated with moisture by 2.13 troy grains of water; at 40° by 2.86 grains, at 50° by 4.12 grains, at 60° by 5.75 grains, at 70° by 8 grains, at 80° by 11 grains. At the freezing point, the amount present is likely to be nearly uniform everywhere; but in open localities the point of saturation may not always be reached. When the amount falls much below the point of saturation with the thermometer at 80° or 90°, the sensations conveyed to the body are not the most pleasant or beneficial, it being considered necessary for comfort and for health that the atmosphere we breathe should contain 70 per cent. of its saturation-amount of water,—50 per cent. being considered the extreme of tolerance in reduction, and 75 per cent. a proper average. Within this range of from 50 to 75 per cent. of water saturation, a heated room may fluctuate without detriment; but when the heat is raised to 75° or upward, and the supply of moisture does not keep near the ratio of moisture capacity, discomfort ensues.

Curiously enough, a room that is relatively deficient in moisture gives a sensation of being insufficiently heated, even when the thermometer stands several degrees above a proper point. I have seen, times and again, rooms heated by furnaces with the thermometer at 78° to 84° F., and the ladies complaining of being chilly, and wrapping light shawls about their shoulders, and complaining that "the man" who attended to the furnace should be discharged for his constantly neglecting to keep the house properly warmed! The discomfort was due chiefly to a great deficiency of moisture, the heat being much above the proper point, but the amount of water in the air being too far below the saturation point for the temperature. On introducing considerable water by holding wet cloths over the scorching register, I have seen the temperature of these rooms fall several degrees in a brief time, and the ladies soon declare that they began to feel *warmer* than before! Simply the normal moisture was restored to the atmosphere, and this in turn abstracted considerable of the surplus heat, whence feelings of greater comfort followed.

Furnaces have done immense mischief through this over-drying of the atmosphere, though of late years they have been improved in a measure by provisions made for evaporation. Stoves of thin material, and base-burning anthracite stoves, are always highly

objectionable, unless great care be taken to have a good water-supply constantly evaporating from them. Witness the extent to which furniture will shrink and crack, and hardy pot-plants fade and drop their leaves, in rooms thus heated; and from these observations judge the ill effects wrought upon the lungs and nerves of human beings living in a room too dry and too hot, and liable to have noxious gases escaping through the surface and by the joints of such stoves. Much of the comfort obtainable from a good base-burner, is overborne by its lack of any provision for placing upon it a vessel for constantly evaporating water. Who but remembers some old-fashioned country kitchen, of ample size and well lighted, heated generally from a cooking-stove of large surface with a moderate fire, on which the kettle made its soft music all day in winter-time, and where a flourishing geranium in the window never knew the dangers of an arid atmosphere.

In connection with this subject, it is well to consider the inner walls of a house. These absorb large amounts of heat, varying with different materials; and a thoroughly cold wall will render it difficult to heat a room properly in very cold weather. A brick wall can never be warmed to a reasonable point; and a kitchen basement, or other room finished directly upon the bricks, will always have an unpleasant chilling atmosphere. Stone has the same effect upon a room. Mortar upon lathing is much less objectionable; though a recently plastered house dries out very slowly indeed, and the more so in fall and winter, requiring several weeks to render the house habitable. Many a life has been lost by moving into a new house before its plaster had been dried thoroughly, and no family should allow any consideration whatever to hurry them prematurely into a new dwelling. A few inches of air space between the plastering and the outer wall of a house, adds greatly to its equable warmth, both in summer and winter. Papered walls absorb less warmth than plaster, and leave the rooms warmer; walls covered with paint absorb more than plaster. Wood absorbs least of all; and the old-fashioned plan of wainscoting rooms was very conducive to comfort and health, and might be renewed artistically to decided advantage in the principal living rooms of a home.

CHAPTER VI.

IMPURE AIR. VENTILATION.

VENTILATION consists in removing noxious air from a room, and supplying fresh air in its place. If the impure air is removed, the outer and fresh air will generally find ingress through cracks about doors and windows, and some through the walls. The first problem, therefore, in securing proper ventilation will be to provide suitable means for the escape of air that has become impure. When this has been done, the influx of fresh air needs merely such regulating as not to subject the people in the room to currents that might be harmful by too suddenly changing the temperature.

Air in a house is made impure from a variety of sources, some of which are overlooked or even ignored. Among these may be named the cellar. Mention of this has been made elsewhere (p. 26). During the summer months, when doors and windows are almost constantly open, the condition of the cellar will not make a noticeable impression. But during the colder portions of the year, when doors and windows are closed and heat in the rooms invites a movement of the cooler air from below, whatever gases are in the cellar can not fail to permeate the whole house. A damp and unwholesome atmosphere there, will make itself felt through every room; and any vegetables there stored in a musty or half decayed condition, will be felt throughout the house. One can not be too careful in keeping thoroughly clean and dry the cellar under the house; and in providing for the ready exit of its gases by a flue running up by the side of the main chimney.

Another source of impurity is found in the lights used in the house. These, whether from candles or oil, and especially from illuminating gas, consume a considerable portion of the oxygen of the atmosphere,—oxygen being the gas upon which all animal life depends for its continuance. While consuming this, the lights are giving into the room various noxious gases as the result of their burning. The combustion that produces light from all such substances, uses the oxygen and forms a junction between it and the carbon in the oils or gas, the product of such union being chiefly what is known as carbonic acid gas. It is this gas principally that accumulates in old wells and vaults, and quickly stupefies and kills those who go down into such places before the gas is

removed. French people used to have a fashionable way of committing suicide by burning charcoal in a room with doors and windows tightly closed, the carbonic acid and carbonic oxide gases soon stupefying them and causing death. In a similar manner death is often met when persons not used to the illuminating gas of cities, *blow it out* as they would a lamp or candle at home, instead of *turning it off* by the faucet in the pipe. The gas, which contains much carbon with hydrogen, continues to flow, soon stupefies the man, and finally suffocates him. An anthracite or any other stove may have its *escape draughts* so closed as to prevent the full exit of the gases of combustion; and during the night these may accumulate in a room to a serious or fatal extent.

Electric lights produce no gases and no heat, and are on these accounts very desirable in stores, factories, and other similar places. But our common household means of lighting are bountiful sources of noxious gases, the illuminating gas of towns and cities furnishing several of these (including certain forms of sulphurous gas) in addition to the carbonic acid. This fact should be taken into consideration when providing means for ventilating; demanding that the escape of foul air shall be most free in the evening,—when the family is gathered in the room, and lights are burning, and doors are less frequently opened than during the day. A bad quality of kerosene is not only dangerous from its liability to explosion, but emits more and much worse gases than a good kerosene. A coal-oil lamp so turned down on the family retiring as to keep a little light for the night, does not consume all the oil that comes up the wick, yet maintains enough heat in its flame to change that oil into the most unwholesome gases. One small lamp used in this way as a night-lamp, fills the room with a most offensive odor, and is very decidedly objectionable to health. People, especially children, sleeping in a room with a coal-oil lamp burning low, are weakened in throat and lungs, and are pale and languid in the morning.

Stoves consume large quantities of the oxygen in a room, and thus reduce the percentage of this necessary element. When too thin or overheated they poison the air by allowing noxious gases to escape through the interstices of the metal (p. 35). In both these ways they may greatly reduce the purity of the atmosphere, and always demand increased care in providing ventilation. Fortunately, the heat obtained from stoves creates the air-currents that are needed for good ventilation, and renders this the more easy.

A principal and constant source of impurity in the atmosphere of a house, is the human body itself. This is continuously taking oxygen from the air into the lungs and using it in these organs for the purposes of life, thus reducing the proportion present in a closed room and requiring a steady ingress of fresh air to maintain the oxygen supply. At the same time the lungs are giving off carbonic acid gas, and small portions of other gases; together with various animal matters resulting from bodily changes, and which are highly offensive. And the surface of the entire body is also casting off animal exhalations, which, though small in amount, are exceedingly harmful and inclined speedily to undergo decomposition. These exhalations are the chief sources of the exceedingly disagreeable smell noticeable on going into a closed house from the fresh air, in bed rooms before they have been ventilated in the morning, and in rooms that have been long shut up. And these animal exhalations are deposited upon furniture (sometimes forming a greasy-looking film on varnished surfaces and glasses), in the carpets, clothing in a bed room, etc. Moisture absorbs these exhalations readily; and water standing in a sleeping room over night becomes so charged with them as to be very impure. All such exhalations soon undergo putrefaction, and charge the atmosphere with the vile emanations of animal decay. Even good ventilation can not overcome the foul smells arising from an uncleanly person; or from soiled furniture, dirty clothing, old boots and sweated apparel thrust into a closet, etc. It requires plenty of scouring, washing and sunlight to cleanse such things.

From the power of moisture to absorb and retain the emanations from decaying substances, we have one fruitful source of atmospheric impurity. This is exhibited on a large scale in cities upon wet and foggy days, when the noxious gases that usually rise and escape, are carried down with the falling moisture. On such days, the well feel burdened and oppressed, and the sick lose ground. Matters of this kind are also generally brought down by dew and fog; hence in cities, and in seasons and sections where vegetable decay is extensive and rapid, the open night air is frequently impure and deleterious. On this account, night exposures in summer weather are in many places dangerous to health; and while it is true, as Florence Nightingale said, that at night we have no other than night-air to breathe, it makes a material difference with health as to whether we breathe it saturated with moisture that is laden with the products of decomposition,

or breathe it indoors sufficiently warmed to drive off the surplus moisture and expel most of the noxious elements of decay. Exposure on foggy nights in malarial districts is well-known to produce malarial diseases; but a small fire on the open hearth maintained constantly, brings immunity from malaria, in the worst districts, to those who remain indoors after night-fall. Without such means of drying the in-door air, it is no better at night than that which is outside the house; but can be made even worse by closing doors and windows to "keep out the night-air," and thus retaining the animal exhalations of the body to add to the products of vegetable decay already in the fog of a malarial district.

In large cities, there are two especial sources of atmospheric impurity, namely: Illuminating gas and animal decay. Mention has already been made of both these, but a few special remarks seem desirable. Illuminating gas is itself poisonous; and it requires watchfulness to prevent small leakages in pipes and the consequent vitiation of the house-air to a damaging degree. In combustion, a single gas-burner produces several times more carbonic acid gas per minute than is given off by one pair of lungs; and in addition evolves considerable percentages of sulphurous gases, ammonia, etc. On these accounts, very extra care in ventilation is needed where gas is used; and when the burners are numerous, and still more imperatively where many people are gathered in large offices and factories, the means of ventilation must be the most ample and effective possible.

Cities offer in a given area a large excess of excreta, rubbish, waste, and other sources of impurity. Whether in vaults or by saturation of the soil, the decay of these exhales large quantities of noxious gases. The more closed-in position of most rooms, and the necessary fastening of these at night to secure against burglars, interfere with easy ventilation. Bath-rooms, water-closets, and sewer-pipes in-doors, while requisites of modern civilization, are in danger of adding seriously to the impurities of city air. Such surroundings make it imperative that personal and house-hold cleanliness shall be maintained to the highest degree, else a breathable atmosphere can not be obtained in city homes.

Gases are exceedingly mobile, and mingle with each other very readily. Although varying in specific gravity, it requires but a gentle current promptly to distribute the heavier among the lighter, and to prevent them from settling and of so occupying the earth's surface as to make a life-sustaining supply of oxygen

impossible. For the sources of unwholesome gaseous emanations are so numerous, that the heavier and more offensive would soon occupy a stratum higher than the head of man, were they not dissipated readily among the others and through the atmosphere as a whole. Wells, vaults, cellars, caves, and other enclosed depressions, as also enclosed rooms and habitations situated in narrow valleys, impede in varying degrees this distribution of gases. Yet even these obstacles do not wholly prevent their commingling; and it requires but a slight removal of the obstacles and a gentle movement of the air, so to distribute them as very soon to make the air of the lowest valley relatively the same in its constituents as that of the hill-tops. It is this property among gases that makes the purification of cities and houses possible.

In consequence of this perpetual mingling of the bad with the good, the air is not absolutely pure at any point. Carbonic acid gas is present everywhere, constituting about four parts in each ten thousand volumes of the atmosphere. Carbonic oxide, sulphuretted hydrogen, ammonia, and other gaseous and volatile products of vegetable and animal decay, are found in minute traces everywhere. But the quantity of these is so very small, that they do no perceptible damage except where they accumulate by impediments; and as vegetable growth and various chemical changes perpetually in progress on the earth's surface remove them, growing vegetables especially using the carbonic acid gas, their large accumulation in the general atmosphere is prevented. Ventilation so employs this law of the distribution of gases as to remove impediments and facilitate its action, thus hastening the dilution with good air of the harmful emanations that arise from such numerous sources in and about our homes, and so keeping the atmosphere we breathe as nearly pure as possible.

An adult man gives off from his lungs fully 0.6 cubic feet of carbonic acid gas in an hour. By the skin a small quantity is also eliminated. The amount is lessened during sleep, but is increased by work. An average for the sleeping and waking hours is 0.7 cubic feet per hour, or more than 16 cubic feet in twenty-four hours. Women evolve less; so do children and aged people. While the animal exhalations are much more deleterious than the carbonic acid gas, it is convenient to estimate the amount of fresh air required for health by considering the amount that will be required to dilute this gas to a safe degree,—to replace the air that it has fouled.

As above stated, the ordinary atmosphere contains four parts of carbonic acid gas in each ten thousand (0.0004). In houses it is commonly six in ten thousand, which is an allowable percentage and as near the point of purity as is usually attainable,—it being impossible to maintain the air of a room at the outer standard of purity. The lungs emitting 0.7 of a cubic foot of the carbon gas per hour, will require fully 3,000 cubic feet of fresh air per hour to dilute it so as to keep the atmosphere of the room at about six parts of carbonic acid gas to ten thousand. And this amount should be allowed as the proper supply for each pair of lungs in a closed room, but is scarcely attainable without too much draught. Children require less,—about 2,000 feet per hour.

A burning candle produces as much carbonic acid gas as a man; a kerosene lamp from two to three times as much; an ordinary gas burner from three to five times as much. These data have been carefully tested and computed by competent authority. From them we can estimate how much outer air should pass into and through a room each hour, when that room is occupied by from four to six persons and one or more lights are burning in it during the evening. It is well that the human frame can for a time endure much that is detrimental, and rally from bad influences; for the real amount of fresh air that *should* be supplied, is so much larger than *is* supplied, that the deficiency is a sharp tax on human endurance. It is not at all surprising that, with the usual ventilation of small family sitting rooms on cool evenings, the elder people soon drop into a sluggish sleep; and the young people get uncomfortable and dull, and seek some form of excitement away from home in order to sustain a reasonable wakefulness. In school rooms, churches, and similar places, the effects of insufficient ventilation are soon observed in feelings of laziness, dullness and drowsiness.

The amount of carbonic acid gas present in a room or house, principally derived from respiration, is a fair index of the total pollution of the atmosphere. This pollution, as has been noted, includes the exhalation of animal matters by the lungs and skin. These are far more poisonous than the carbon gas, and give the foul smells to a close room; yet it is impracticable to measure them accurately in every case, and the amount of carbon gas has been found to bear such a fixed ratio to them, that the percentage of these present is fairly represented by the proportion of carbonic acid gas present.

Smith of England, Pettenkofer and Oertel of Germany, and various official State Reports in America, have furnished some instructive data showing the great increase above 4 parts in 10,000 that occurs in various positions. Among these may be quoted the following: Surry Theatre at 10 P. M., 11 parts in 10,000. Same, two hours later, 21.8. Pit of London Theatre 11 P. M., 25.0. Standard Theatre, 32.0. Philadelphia Schools, average, 13.15. Boston Schools, 14.5. Michigan Schools, 24.00. A German School, in July, 41.00. Same, in March, 56.7. Boston Sunday-School, before opening, 7.21. Same, an hour later, 29.51. Same, after another half hour, 31.96. Passenger Cars, 15.9 to 36.7. When we remember that 7 parts in 10,000 (taken in connection with the accompanying animal exhalations) is as large a percentage as can be breathed for any length of time with health and comfort, we can estimate the offensiveness of 20 to 30 parts.

A family sitting room occupied by five or six persons on a winter evening, with a fire and lamp, will soon run up the carbonic acid to 30 parts in 10,000, and the more baneful emanations in proportion, if the ventilation is not free and constant. Two adults and two children occupying a sleeping room 12x14 feet and 9 feet in the ceiling, with doors and windows closed, would fill its atmosphere during the night with from 40 to 60 parts of carbonic acid gas to the 10,000. And in such a case the organic exhalations would reach the point of saturation possible to the air,—which is limited according to the degree of heat and moisture,—and then would be deposited on the clothing and furniture.

The effects of imperfect ventilation, or, in other words, the consequences of breathing an atmosphere vitiated by carbonic acid gas and the animal exhalations, are not perceptible at once. As in the cases of other unwholesome influences, they impress themselves gradually,—the delicate and those kept in-doors feeling them soonest. Those who are out-of-doors most or all of the day, seem to store up within their bodies a surplus of oxygen; and then through the night can endure an impurity of atmosphere that would be prostrating and sickening to those who were abroad very little during the day. Sick people, especially the fevered, feel most sensibly a close atmosphere, their own bodily emanations being then more abundant and poisonous than at other times. Deprived of a sufficient amount of oxygen, breathing and re-breathing the impurities cast off from their own bodies, the consequences must be depression of the heart and circulation, loss on the part of the nervous system, and slow blood-poisoning of animal character.

Among the more immediate effects of insufficient ventilation are: Hurrying of the pulse with signs of its weakening. Slight hurrying of the respiration, and some sense of oppression in the breath. Lassitude, feelings of dullness, a restless desire to change positions or to get to another room, weakness, thirst, followed by drowsiness and heavy breathing during the sleep. Waking from such a sleep, the person looks pale, feels unrefreshed and languid, and is probably irritable.

But it is oftenest among the young, the delicate, the enfeebled, and those already sick, that the consequences are finally apparent. Children grow pallid and drooping when subjected to breathing an impure air; and easily yield to the severe forms of children's diseases, as cholera infantum and diphtheria. Women, who are so much of their time in-doors, become pale and nervous under such circumstances, lose appetite, feel wretched without being especially able to tell how or where, and perceptibly lose ground in respect to constitutional vigor. Among infants, the wounded in hospitals, and lying-in women, the death-rate is enormously increased in close and ill-ventilated quarters; and materially reduced when better and more airy quarters are obtained, or the season permits of a more bountiful supply of pure air. Infant mortality among the poor in large cities is appaling, especially in summer when the rapid decay of animal emanations burdens their small heated rooms with offensive effluvia, even with the windows open. The invigorating effects of a single day in the free country air, now so frequently provided by the humane for such breath-oppressed city children and their sad mothers,—the effect, I say, of even one day in a pure atmosphere is quite distinct. The temperature in the country may be as great as that in the city; but an escape for even twelve hours from the noxious air of impure quarters in the city brings a rallying force that may carry these hapless ones safely through the remainder of the heated term. Were avaricious men in cities compelled to provide larger rooms and more perfect ventilation for poor tenants, as is now the law in England; and were tenants themselves to keep their houses and persons in more cleanly condition, the summer death-rate would probably be reduced one-third or even one-half.

Deficiency of oxygen, coupled with the gaseous and other emanations from the body, greatly favors the development of consumption. When associated with dark rooms, as is too common, the results are speedy and palpable. This has been recorded on a

large scale in English and German barracks, where the utmost cleanliness was enforced but the air-space allowed to each soldier used to be barely one-fourth of what it should be. Deaths from consumption and other wasting lung troubles continued astonishingly large; but quickly diminished fully three-fourths when the air-space per head was increased properly. Consumption develops alarmingly under such circumstances in cities; also its twin sisters, marasmus and scrofula. Infantile summer diarrhea is greatly promoted by a bad atmosphere. During epidemics of typhus, typhoid, diphtheria, cholera, and similar diseases, the mortality is immensely greatest among those in crowded sections, even with surrounding cleanliness.

What is true in cities is equally true under similar conditions in the country. Farmers surrounded with Heaven's purest air and light, shut them out of their houses, and then wonder why certain delicate ones among their children die of consumption. "There is no consumption in the families on either side"; and yet one or more daughters and sons droop and die from this malady. It may be an easy task to find the causes of this. The house may have a damp cellar; and slowly decaying vegetables in this may send their insidious poisons up through the rooms a large portion of the year. The rooms themselves, while scrupulously clean, are kept too dark and too much closed up; and most of them are too small for the family requirements, and no suitable ventilation is provided for or practiced from the day the doors and windows are closed in the fall till the heats of next spring allow them to be kept open. In such small living-rooms the women of the family stay nearly all the time; and the other members join them and the lights in the evening. All sleep in bed-rooms entirely too small, and generally deprived of any ventilation whatever. Such families, and especially the children and female members, are ready subjects for any epidemic whatever. And when the physician finds them drooping and gradually declining till consumption develops among them, he knows too well the years of ill-ventilation by which the family itself provided for this inevitable result, and which he perhaps all those years urged in vain to have corrected.

The very animals succumb to deficient ventilation, though their surroundings otherwise are sanitary. The horses in the French army used to die annually at the rate of 180 to 197 out of every thousand. Since 1836, the stables have been enlarged and a much increased allowance of air provided for each horse; the result of

which has been the reduction of the death-rate to 68 per thousand. Similar facts are known in regard to the cavalry horses of England and Prussia, among whom the former death rate of 113 and 109, respectively, has been reduced to 20 and 15 per thousand. The Prussian cavalry has the largest air-space, and the lowest death-rate.

Dr. A. H. Buck, in his volumes on Hygiene, quotes the following from Dr. Arnett about the monkeys in the London Zoological Gardens: "A new house was built to receive the monkeys, and no expense was spared which, in the opinion of those entrusted with its management, could insure to those natives of a warm climate all attainable comfort and security. Unhappily, however, it was believed that the object would be best secured by making the new room nearly like what an English gentleman's drawing-room is. For warming it, two grates were put in, as close to the floor as possible, and with low chimney openings that the heated air in the room should not escape by the chimney, while the windows and other openings above were made as close as possible. Some additional warm air was admitted through openings in the floor from around hot-water pipes placed beneath it. For ventilation in cold weather, openings were made in the skirting of the room close to the floor, with the erroneous idea that the carbonic acid produced in respiration of the animals, being heavier than the other air in the room, would separate from this and escape. When all this was done, sixty healthy monkeys, many of which had already borne several winters in England, were put into the room. A month afterward more than fifty of them were dead, and the few remaining ones were dying. It was only necessary to open in the winter, part of the ventilating apparatus near the ceiling, which had been prepared for the summer, and the room became at once salubrious." Those monkeys died of consumption.

It has been stated that an adult man requires about 3,000 cubic feet of air each hour to provide the necessary amount of oxygen. This refers especially to rooms constantly occupied, and from which the products of animal life must be removed by ventilation. It would be practically impossible to build houses with rooms of such dimensions,—which would be about 18 feet square and 10 feet 6 inches in the ceiling, for each inmate. But this want is supplied by allowing not less than 1,000 cubic feet of air-space, and then providing by ventilation for that steady removal of waste and renewal of fresh air that are necessary. With a ceiling of nine and a half feet a room ten by eleven would furnish 1,045 cubic feet of

space. Occupied by one person, the air of such a room should be replaced every twenty minutes to maintain its purity. But such rapid ventilation of so small a room would, in cold weather, create draughts that would be dangerous. A family room 16 by 20, and ten feet in the ceiling, (eleven feet would be a better proportion), gives 3,200 cubic feet. If five persons occupy such a room on a winter evening, the total volume of air should be changed every twenty minutes. Such rapid ventilation cannot be effected safely in the small room, but can be accomplished in the larger room, and should be, if the family desire to maintain the atmosphere in a state of reasonable healthfulness.

In providing for such renewal of the air in a room or house, it is first necessary that the means of escape for the foul air shall be ample. That two bodies cannot occupy the same space at the same time, is as true of gases as it is of solids; and fresh air cannot replace that which is foul, except as the latter finds unobstructed exit to the outer atmosphere. As, under the law of diffusion of gases above mentioned, the heavier are pretty evenly distributed among the lighter, the impure among the healthful, the exit openings should be toward the ceilings. The heat in the room gives an upward current. If the heated air now find free escape above, it will carry with it the impure gases of respiration and combustion; and then the colder air at lower points will flow in to take the place of that which is rising to escape. The gentle currents thus created will soon distribute the colder air with the heated air of the room; and these currents will not be felt by the occupants if the room is of suitable size and precautions are taken to distribute the inflowing wave of cold air.

Heated air cannot possibly descend, but the hottest is always a-top. It may be drawn off by a system of siphoning,—an escape being provided at a point in the floor, through which the air is conducted to an ample pipe ascending by the chimney-stack. If the heat of the chimney heat up the air in this pipe, and create an up-current through it, the cooler portion of the air in the room will be drawn down to the ventilating opening in the floor, and the foul gases thus escape. For assembly-rooms, schools, churches, hospitals, etc., this is the most desirable method. It requires an assured heating of the ascending pipe, that this pipe shall have a large capacity, and that cold air shall have free ingress in many small streams at some line near the ceiling.

Ventilation by the above plan is not possible to the mass of

houses, which require simple and cheap methods. A very common mistake in these, is to attempt ventilation by raising a lower sash. This is useless, perhaps worse than useless. It admits direct and cold currents to the lower parts of the room, which may be dangerous to children on the floor; but it does not permit the escape of impure air above the level of the opening. Here the combination of heat and impurity goes on increasing; the upper air becomes exceedingly foul, and is continuously re-breathed by the adults—whose heads are above the open line of the window; and the air near the floor is so cold as to make it unpleasant to the feet of all in the room. Such an attempt at ventilation is a total failure. Fortunately, the discomfort caused by the different temperatures at the floor and at the level of the head, soon compels a closing of the raised sash, else dangerous colds would be suffered by all the occupants. If a door on the other side of the room is thrown open, a raised sash will conduce to the rapid sluicing of the room; but that does not fill the requirements of steady ventilation, though often desirable at intervals when a room is occupied for hours by a number of people.

By letting down one or more upper sashes, the heated air near the ceiling will escape readily, and add to the upward current already created by the stove or other heating apparatus. Outer air then enters by the opening between the separated sash-rails,—enters with a slight upward current, and is distributed through the room and gets moderately heated before falling to the floor. If the upper sash be let down several inches, a current of cold air will enter at the lower line while the hot air escapes at the upper line, thus giving an in and an out current through the selfsame opening. These currents are liable to various fluctuations according to the outside wind, opening of doors, etc.; and the cold air that enters is likely to fall into the room with such a direct current as to be unpleasant and unhealthful. Far better to make the high openings narrow, so they will be merely passages of escape; and then provide at other places for an in-current, if the openings between the sashes are not sufficient.

If windows do not let down from the top, they should be made to do so by removing the supporting slat and shortening it two or three inches. Better break an upper pane of glass than remain in any room without providing for escape of the upper strata of air. An open transom above the door of a room is an admirable means of ventilation, and at least all bed-rooms should be provided with

such. By lowering a sash in the upper hall, or in the highest room in the house, a steady upward current will be created and escape by this highest vent, and the admission of fresh air to the rooms will then be a simple matter.

Where door and window are both on one side of a room, or upon different sides but near the same end, ventilation of the whole room is impossible. In the further end of it will be a body of air that changes too slowly to be suitably purified, and that becomes close, flat and impure. Door and windows should be on different sides of the room ; if possible to arrange for windows on two sides, it should be done ; and if windows can be on but one side, the door should be either on the opposite end, or somewhat near the opposite end at the side.

When the openings for escape of impure air are well placed and suitably opened, the in-currents of fresh air can be arranged easily. Some air will constantly find its way through the walls of frame houses ; more through the small crevices about all windows and doors ; repeatedly opening a door gives a larger in-flow. But these will not be sufficient during the evening in a family room or in a bed-room during the night, or in a sick room where the increased emanations from the patient demand a large increase of fresh air. If the lowering of an upper sash is not sufficient, open two of them ; and if yet more is needed, a lower sash may be raised an inch or more, and the cold current flowing into the room be thrown upward by a board four or five inches high placed across the window sill and a couple of inches from the sash. Raising the window nearest the stove while lowering the one farthest from it, (or opening the transom,) is the better plan.

For reasons that are obvious, direct currents of cold air should not be allowed to pass over the occupants of a room, but must always be broken and distributed by screen or other contrivance. Little children playing on the floor, with wide cracks beneath the door, often suffer materially in this way ; also in frame houses in high latitudes where the walls are thin and the fillings very open. The amount of fresh air will not be damaging ; but its unbroken draft over the floor or the bed may be disastrous. In sleep, the circulation is least vigorous and colds of severe degree are easily induced by such drafts. The sick, while needing a very large supply of fresh air, cannot endure cold currents, and must be thoroughly screened from direct drafts at the same time that the most ample ventilation is provided for them.

CHAPTER VII.

THE QUALITY OF THE WATER SUPPLY.

A SUPPLY of pure water is a necessity; impure water being the source of several intractable diseases, and many times being the medium of developing and extending epidemics of typhus, typhoid, cholera, and other dangerous maladies, in the severer forms. Air in a room can purify itself, if given an opportunity, by its property of mobility and the law of diffusion of gases (p. 43); and the atmosphere of large cities, constantly receiving polluting emanations in great quantities, is by this law kept comparatively wholesome. But impure water can not thus purify itself; and can be rendered potable only by much care, and in some instances can not be made usable at all.

It is of great importance, therefore, in an article so constantly necessary to existence, that the supply should be obtained from the purest source possible, and then protected from being contaminated with any thing injurious. Fortunately, in our own favored country, it is an easy thing nearly everywhere to obtain a supply of a potable article; though in some sections, especially in malarial districts, this is difficult. But the most perfect article may be ruined by man's own carelessness and lack of forethought, and this most frequently in country districts where pure water is most readily obtained. Washings and drainage from vaults, cesspools, pig-sties, barn-yards and manured fields, may reach the farm well, and impregnate its water to a dangerous degree. The water may continue to look clear, and to taste sweet to those accustomed to it; but sight and taste are not always correct, and it is quite possible for water that looks "clear as crystal" to contain noxious elements in quantities sufficient to work serious mischief. These are chiefly organic, and especially are of animal origin,—the most dangerous possible. A farmer is usually proud of the well on his place, repels as a personal insult any intimation that its water has become unwholesome, and generally refuses to be convinced of the simple fact, till he suffers the loss of wife, or child, or perhaps most of his family. Human sight and taste are fallible; but a correct application of chemical science will answer with absolute certainty as to the wholesomeness or unwholesomeness of any sample of water.

Most rivers and small streams naturally contain "soft" water,

i. e., water that will readily make a suds or lather with soap. This is always a necessary quality for washing the person, washing clothes, and other purposes of cleanliness; and water not at first soft, must in some way be rendered so in a large measure, before it can be effective for such uses. Rain is always soft water. The majority of springs, and of wells (which are but reservoirs supplied by deep spring-currents), contain water that is more or less "hard." The substances giving this property are obtained from the soil through which the water has passed, being dissolved and held in solution by the water and its carbonic acid gas. They are principally of mineral character, a solution of common limestone being most frequent and abundant; of magnesian with common limestone, of lime sulphate (plaster-of-Paris), etc. Such substances greatly lessen the value of water for washing and similar household uses; but a moderate amount of lime carbonate is not injurious to health, although very hard water often weakens digestion and provokes diarrhoea in those not accustomed to it. A little lime undoubtedly supplies materials for the development of bone in men and cattle. Magnesium and lime sulphate are much more objectionable than lime carbonate; being usable in the frame only in minute quantities, and giving "permanent" hardness not easily removed from water.

But springs and wells may obtain from the soil, and hold in suspension or solution, a large number of other mineral substances and compounds, some of which are medicinal, others mildly or severely poisonous. Among these may be named such articles as iron, salt, bromine, epsom salts, sulphur, various gases, alum, and others found in the well-known medicated springs; and such substances as compounds of lead, zinc, arsenic and copper. These latter are generally offensive to the taste in very small quantities, and soon cause disagreeable sensations in the throat and stomach; hence are quickly pronounced unfit for use and put aside. But taste alone can not decide the presence of many other and simpler inorganic compounds dissolved in water, when in moderate quantities. Persons differ in their ability to detect these compounds; but the following is a good average of the number of grains in a gallon of water when its taste is first detected: Common limestone, 10 to 12 grains; lime nitrate, 15 to 20; gypsum (plaster-of-Paris), 25 to 30; common salt, 60 to 75; carbonated (washing) soda, 60 to 65; iron, two-tenths of a grain. As these waters contain a variety of such substances, and not merely a single substance, it has been found

that the presence of from 35 to 40 grains of them mixed, especially if the mixture contain 5 to 8 grains of dissolved gypsum, will impart a perceptible taste.

It is generally supposed that the agreeable taste of water is imparted to it by the limestone it holds in solution; but this is not the fact, although a limited portion of limestone is mostly acceptable. The palatable taste is due rather to the various gases held in the water, and very especially to the carbonic acid gas obtained by it as it falls and passes through the earth. When water is boiled, and its air and gases are driven off, it ceases to be sparkling, and its taste is quite "flat" and insipid; whence it is that distilled water, though absolutely pure, is not very palatable. Sulphurous gases, principally sulphuretted hydrogen, exist in many springs; and are extremely offensive to most persons at first, though the majority soon come to be very fond of such water and value it for its medicinal properties.

Every class of soil, including the sandy, retains more or less water, even under the protracted heats of summer. Clay of pure, compact quality is nearly impervious; and that body of water below the first clay stratum in any locality, is called the *ground water*. Water passing over and through different soils, necessarily dissolves different classes of materials; hence the source of water-supply is a question of importance in seeking a good article. It is generally purest when obtained from such soils as granite, clay-slate, trap rock, and mill-stone grit. Soft sand-rock, loose sand, and gravel, commonly give a pure supply; but at times these are mixed with such other soils as impart much impurity, and especially if near towns or cities. These soils are also good purifiers to the underground current that flows very slowly through them; but the very slowness of that current gives the water ample time to dissolve out any soluble matters present, which are mostly alkaline and often organic. Stiff clays at times yield much suspended matter; and alluvium—a mixture with sand and clay—generally gives objectionable minerals and considerable organic matter. Every suspected water should be examined chemically and microscopically, and its fitness for household uses definitely determined.

It is a popular belief that the earth will purify the water passing through it, and act as a filter in effectually removing noxious substances. This is true to a limited extent. This fluid is nature's great solvent, making possible the solution of soils necessary to plant life, and many other changes and operations in the earth's

crust; and we have seen that in this property of solving elements, it carries many of them along with it from the earth into springs and wells. For a time, the earth will take up various organic substances and not allow them to pass into its water-current. Such organic substances may be either vegetable or animal in origin, fresh or in some stage of decay, insoluble or soluble by water. But sooner or later the soil will become saturated with such matters, and incapable of removing any more of them; when the surplus will pass on with the water-current, and presently be found in springs or wells.

Springs contain few traces of organic matter; but wells badly situated, and some rivers and small streams, contain such materials in larger quantities. Few waters are entirely free from them; in some waters they are of unobjectionable character; but in other cases their presence in small quantities is a source of grave danger. Organic materials recently decayed, or not decayed at all, are most objectionable; and those of animal origin are always far the more seriously offensive.

The sources of organic contamination are various. Marshy lands generally convey to the water much soluble vegetable matter, usually prolific of malarial troubles but sometimes not deleterious. Surface water where the clay substratum is near the top, and drainage from plowed and manured lands, are likely to be quite impure with organic matter. Towns and cities cast most or all of their sewage into adjacent streams, and thus pollute them fearfully; but rapidly flowing streams, especially when the current is much disturbed so as to bring the water continuously to the air, will oxidize organic substances and presently render them comparatively or altogether harmless. Stagnant water in ponds or very sluggish streams soon becomes offensive; and it is this kind that so commonly presents various forms of minute vegetable growth and of animal life under the microscope.

Water in wells, though for years as nearly pure as water can be, may become impure by organic materials finding their way into it. Sometimes this occurs from the surface water making a current toward the well from adjacent yards, fields, or marshy places,—often noticed when the well gets very low soon after a rainy season. It is stated that in the beautiful mountains of California, the irrigation with pure mountain water will sometimes carry into the wells nearer the sea a large amount of decaying vegetable matter, causing malarial diseases to those using water from such wells.

A more common source of organic impurities to wells, is the soaking from privies, barn-yards, pig-sties, and kitchen drains. Little by little, such matters saturate the soil, trickle downward, and at last find their way to a family well situated too near to them, and the more so if deep. Sandy and porous soils, or rocky strata dipping toward such a well, are in great danger of causing this pollution, which may continue some time and cause disaster before it is detected.

It is revolting to consider such a possibility, and farmers especially are inclined promptly and vehemently to reject the suggestion; but the fact is indisputable, and water from family vaults and town sewers has been traced, times and again, through minute channels into wells a distance of fifty, eighty, and even an hundred feet. Cracked and faulty sewers and drains are the prolific sources of such contamination in cities. Memphis, Louisville, and some other cities with sandy subsoil, getting their water supply from deep wells, have suffered terribly from city filth slowly trickling down into these water reservoirs. "In one cholera season in London, six hundred deaths were traced to the use of a single street pump. Typhoid fever has been repeatedly known to affect whole families who resorted to a well for a common supply; while others in the same neighborhood, using different water, were not attacked. Worse yet seems to be the subtlety with which organic poison may be conveyed, by water, through milk in dairy-men's supplies. Several times this has happened in London and elsewhere in England. Nothing is more sensitive than milk and cream to all impurities. The water which cows drink, when marshy and bad, has been known to make their milk unwholesome."—(*Prof. H. Hartshorne, M. D.*)

"The ingredients which are especially dangerous in water are of animal origin. The least trace of filth from a cess-pool, drain, or manure heap, may convert drinking water into insidious poison fraught with disease and death. Very frequently the water may be clear and sparkling, and not unpleasant to the taste, so that its polluted condition is not suspected until serious illness has broken out in the household,—illness of a kind which points to filth as the originating cause. A sample is then submitted for chemical analysis, when it is pronounced to be highly polluted and altogether unfit for use. The investigations into the later outbreaks of cholera in this country [England] proved clearly that the disease was, if not wholly, at least to a very large extent, propagated in this

way. But the disease of all others which owes its origin and spread to polluted water, is typhoid fever. In country districts and small towns and villages, where pump-wells and dip-wells constitute the source of supply, this disease is produced far more frequently by polluted water than any other cause. And even in towns provided with a public water supply, many of the most alarming outbreaks of this disease have been traced to contamination of the supply either at its source or in the course of its distribution. . . . It is in villages and country districts where the dangers of water pollution are rifeest. Nor is typhoid fever the only disease which owes its origin to polluted water,—I have very often traced outbreaks of diphtheria to the same cause, as well as numerous cases of common ulcerated sore throat. To polluted water have also been traced repeated outbreaks of low fever, diarrhoea, and dysentery."—(*Dr. Geo. Wilson*).

Driven wells, a form of artesian well made by forcing tubes down, are in much favor in some places, as furnishing an abundant supply of clear water that is usually pure though hard, and this at a limited cost in time and money. But some of these, located near towns and cities with a porous soil, have soon become quite impure and offensive by the drainage into the ground-water of materials from vaults, kitchens, sewers, and stables.

Emptying vessels from the typhoid or other sick-room on the ground near by, has suddenly been followed by an outburst of typhoid among those using water from the adjacent well, although not of the family. The citizens of Plymouth, Pa., in the winter of 1885–6 suffered frightfully from an epidemic of typhoid, traced directly to a family with the disease emptying bed-vessels on the snow close by a little stream from which the town received most of its water supply,—only those who used from the reservoir being the sufferers. Graveyards have at times polluted wells hundreds of feet distant, imparting to them ammoniacal salts, and butyric and other poisonous organic matters.

The list of diseases that may be caused by impure water is quite lengthy. In addition to typhus, typhoid, cholera, and malaria—which are so often extended in this way so frightfully—the following may be named: Diarrhoea and dysentery, from water containing suspended mineral substances; and their severe forms when organic matter is present, either suspended or dissolved. Yellow fever, scarlet fever, and diphtheria have many times found a vehicle for their extension in well water. When any of these maladies

returns upon a community at a certain season of the year, and attacks many families at about the same time, the purity of the drinking water may reasonably be suspected. Certain forms of tape-worm and round worm frequently have their eggs and embryos washed into wells from animal droppings on the ground at considerable distances from the wells; and these finding their way into human stomachs by the unconscious use of that water, are there developed. Poisonous metallic compounds, as of arsenic and copper, are usually soon detected, yet perhaps not until they have provoked sharp inflammation of stomach and bowels. Lead pipes may poison the water passing through them from city reservoirs, soft water attacking this metal more actively and with more power of solubility than hard water; and slow forms of paralytic indigestion and other lead troubles have occasionally resulted in this way. So small a quantity of lead as one-fiftieth to one hundredth of a grain to the gallon, has produced lead paralysis.

The location of a well, therefore, should be made after a careful consideration of its surroundings, with a view to escaping any future contamination from vaults, drains, sewers, barn-yards, or other filth receptacles. The more porous the soil, and the deeper the well, the farther should it be from such spots; and at all times and in the best positions, these sources of possible mischief should be cleansed thoroughly and frequently, so as to allow of no great accumulations. Such cleansing of vaults, etc., is very rarely practiced in the country, and is laughed at as a piece of fastidiousness; but a shallow country outhouse or neglected pig-sty assuredly will allow its contents to be washed into the surface water and thence find way to the family well, as thousands of bereaved families have had demonstrated to their sorrow. It is simply impossible to be too careful or too rigid in all these matters, if health and life are to be preserved; and if a sudden sickness break out in a family, or in several families using one common well, it is the part of good judgment and prudence to at once discontinue the use of that water until its purity has been ascertained by a competent examiner. It is safe to say that no well in a town of any considerable size is suitable to use. A well in compact soil will usually drain into it an area of not less than four times its depth, and in loose soils a decidedly larger area.

It is common to think and speak of "spring water" as always pure; but we have seen that it may be impure, or strongly medicinal and not usable for family purposes, or decidedly poisonous.

A family or a community depending upon spring water, should be certain of its real wholesomeness. Cities generally obtain their water supply from a river, pumping it into reservoirs, and thence distributing it through iron and lead pipes. Such water is usually soft, is sometimes very turbid from earthy materials without being objectionable, but is commonly the vehicle of organic substances. Only the purest streams, and those with a current sufficiently rapid to be purifying, should ever be used for supply. And these should be guarded sedulously against every possibility of contamination; and so should the storage reservoirs. Where lead pipes are used in distribution, the water should be allowed to run off for several minutes before being used in the morning, as this will carry away any solution of the metal that has been formed by the still water during the night. Probably no river supply can be so pure as not to need thorough filtration, to strain out turbidity and to remove dissolved mineral and organic substances. With small streams or large ones, this is the rule necessary to a truly pure supply.

Rain water is the purest ordinarily attainable, and always has the property of softness to commend it for household uses. It contains more air than spring water, and obtains a quantity of carbonic acid gas in its descent. But it is not without solid matter, inorganic and organic, gathered as fine dust from the atmosphere; and sometimes the amount of both these classes of solids is considerable. As it falls upon roofs and passes through gutters, it washes down considerable dust and probably more or less excrement of birds, as well as decaying elements from old shingles, etc. Even when the roof is washed by allowing the first portions of a storm to escape, a cistern may be contaminated in the manner named. In or near cities and large towns, the roofs are too sooty and smoke-stained to allow good water to be gathered from them.

Water stored in a cistern may undergo changes if not duly cared for. If too tightly covered, the small amount of organic material it contains will undergo decay and impart a musty taste and smell to the whole. If open to the sun, it will become polluted by the growth of vegetable spores caught from the air. In a cellar or other close place, an open cistern will absorb objectionable gases. A free access of air through a net-work cover so fine as to exclude insects, should be provided for a cistern; which should also be apart from the house and covered from the sun. Drawing water from it by a chain pump or, better, the bucket

pump keeps it stirred up and aerated, greatly to the improvement of the water. Lead lining or pipes should never be used in a cistern, as this metal is too freely dissolved by soft water. Neither should any decaying wood be allowed in or around it, and every cistern should be cleansed thoroughly at least once a year. A cistern filled during the winter and spring months will have less solid matter than if filled during the summer, and the water will also be colder and the little organic material it contains less liable to decay.

Purification of Water.—While it is comparatively easy to obtain excellent potable water in nearly every part of our favored country, it is yet the fact that in large cities and very many other places it is impossible to procure such a supply, and people are compelled to do the best they can. Under such circumstances, it is necessary to adopt methods of purification. This should be done by the public authorities in municipalities; but families there and elsewhere should understand the simplest and most effective means of accomplishing this object.

Boiling causes the deposit of carbonate of lime and most of the iron; expels gases, including those which are desirable—air and carbonic acid; and to some extent lessens organic matter, though not always destroying minute organisms. It is the most ready mode of purifying.

Agitation, exposing the water to air in an active manner, helps greatly to destroy the bad properties of organic matter; yet its action is less potent than is commonly believed. It is necessary to aerate water that has been deprived of its natural gases, as in distilled water and that which has been long boiled.

Distillation frees water absolutely from both organic and inorganic materials, and is frequently employed at sea; but distilled water should always be agitated thoroughly to charge it with air and make it palatable.

Alum has long been used to purify water from suspended solids, which it does very effectually in water that is hard. It forms a bulky precipitate, which entangles the minute organic and inorganic substances suspended in the water and carries them down. Upon organic matters that are dissolved it has very little action, probably none at all. Two grains of dissolved alum are sufficient to each gallon of water, to be added with brisk stirring for a few moments. The alum itself also falls to the bottom. Turbid waters that are perfectly soft cannot be cleared by alum

till two grains of washing soda to each gallon, and one grain of chloride of lime, have first been stirred into the water, and then the alum solution added.

Perchloride of Iron, at the rate of two grains to the gallon, is very effectual in carrying down the fine particles of clay in some waters, as the Mississippi, the Ohio, and the Maas of Holland, (such waters causing indigestion and diarrhoea). It usually carries down suspended organic matter, and purifies most dissolved organic substances. The very small amount of iron that remains dissolved in the water is no detriment to it.

Filtration.—This is partly a straining process, and partly a chemically purifying one ; the water being passed through various articles to remove the solid matters and to change the deleterious characters of those that are in solution. When the water is turbid from suspended earthy materials, it is desirable to let it settle as fully as can properly be done without continued stagnation ; and then its filtration will the more effectually remove offending substances, and furnish a clear and pure article. This course is pursued on a large scale in Europe, to secure potable water for cities. It is an unpleasant fact that either municipal ignorance or municipal corruption in some American cities continues to furnish the public with unsightly and unwholesome water, that might be made bright and wholesome by means of purification near at hand.

Sand is the cheapest and most convenient article for filtration. It should be sharp, and the finer sizes alternated with that which is coarser ; and before using it should be washed thoroughly. It keeps back sedimentous matter, is quite efficient for removing minute vegetable growths, suspended organic matter, and probably so favors aeration and the escape of surplus carbonic acid gas as to cause the deposit of a considerable share of lime in hard water and render it in a measure softer. Its action is slow, and therefore water should not be passed through it rapidly.

Charcoal is particularly effective in arresting and removing decomposed animal and vegetable matters, and such matters in a state of solution, and the gases remaining from such decay. Animal charcoal (bone black) is more potent than vegetable charcoal. They both have the power of retaining dissolved coloring matter. Charcoal should be pretty finely crushed, and is most effective when alternated with layers of sand. After a time its power is exhausted and it can be of no farther use until itself

thoroughly washed and then purified by heating for some hours almost to the point of dull redness,—usually more costly than it would be to provide an entirely fresh supply. When once surcharged with the materials it has removed, charcoal will begin to give them back to the water passed over it, and even filtered water remaining in contact with it will soon become tainted.

Iron, in some of its forms, is the most effective and permanent of all articles used for filtration, though its action is very slow. The form known as spongy iron, crushed or made into blocks of varying thickness, is one of the best; that called carferal is probably best of all, and is used in the granular form. Iron arrests the suspended matters, also purifies from organic matters in solution, and removes lead. Water left in contact with it will not deteriorate, and it retains its power of filtration a long time. It imparts a very little iron to water, which is not objectionable though it can in turn be removed by passing the water through sand.

For the mere purposes of straining for family use, where water is turbid, one may use sponge, flannel, or cotton (Canton) flannel. But these articles soon become clogged, and would then quickly undergo the slow decay incident to all wet animal and vegetable substances; hence when such articles are permitted to enter into the construction of a filter, they should be cleansed or removed every few days. Asbestos is a much more perfect strainer, and can be purified by washing and then heating to redness.

It is most desirable to make some combination of these several materials, so that each may remove a special class of substances. Usually coarse sand or gravel is placed below, finer sand above, and charcoal between these in a suitable vessel with an opening below. A simple, cheap, and very desirable family filter may be made as follows: Take a large flower pot of common earthenware. Put into the bottom of it two or three layers of white flannel, cut to fit nicely. Upon this spread (well washed and heated) two inches of gravel or coarse sand, then three inches of fine sand; upon this two or three inches of crushed charcoal or bone-black. Upon the top of all place one or two layers of cotton flannel, neatly fitted, with half an inch of gravel above this. By using enough of the flannels to prevent too rapid a flow, and then by first boiling all water suspected of containing organic matter, this filter will be found thoroughly effectual for domestic use. The upper layers of flannel should be renewed every few days, according to the turbidity and impurity of the water.

Every filter, of whatever kind, should be cleansed at moderate intervals. No filter can be perpetually operative; and charcoal filters getting surcharged with organic substances are liable soon to corrupt the water that passes through them. Too many people use a filter as if it must have no care, and hence they derive no benefit from its use after a time. The frequency of its cleansing will depend upon the amount of impurities in the water, and the quantity of water passed through it. No filter is of any permanent value, unless every part of it can be readily reached for this purpose, and removed for renewal when necessary. On this account a porous brick partition in a cistern is a poor filter; for although it effectually clears the water, it cannot be removed when it becomes charged with impurities, which it is likely to do in a year or two, and then its power as a purifier is at an end, and it becomes a source of pollution by the impure materials it has collected.

Hard water, as already intimated, is not suitable for washing and many other domestic purposes. When that hardness is due to the presence of lime or magnesia dissolved by the carbonic acid gas that the water has absorbed in passing through the air and earth, it is called "temporary," because it can be almost entirely removed by boiling it for an hour. This drives off the surplus gas, and that quantity of the gas which has chemically combined with the lime or magnesia remains with it and falls to the bottom of the vessel. It is this which forms the crust in tea-kettles used for boiling hard water. Washing soda may be used for the same purpose, but is too expensive. When gypsum (plaster-of-Paris) causes the hardness, it is called "permanent," and cannot be overcome by these methods, nor any other that is convenient or economical. Permanently hard water should not be used for drinking.

Freezing is commonly supposed to be a complete purifier of water, even of that which is highly impregnated with objectionable materials of any kind whatever. It is indeed true that freezing excludes many foreign substances, but not all of them. Ice taken from small and shallow ponds, from stagnant ponds, and from impure water anywhere, will be found to contain a notable quantity of minute vegetable growths and other suspended matters. Severe sickness has in many sections been known to ensue from using such ice; and it is by far too common for city supplies to be taken from objectionable places economically near by, the public

having no disposition to inquire into its source because of the conviction that the freezing process purifies it. Artificial ice, provided it be made by a machine that uses only distilled water, is absolutely pure. In a country where such enormous quantities of ice are used in summer, the source and quality are important.

CHAPTER VIII.

MEASURES OF PUBLIC HYGIENE.

DUE preservation of the conditions of health, as has been seen in previous chapters, requires constant attention in providing the conditions essential to life. It is not sufficient that such care is bestowed on one condition to the neglect of others, but each influence that is deleterious must be guarded against and its opposite supplied. Be the sunlight ever so well provided for the house, a close, impure atmosphere will impair the health; and if the atmosphere in rooms is thoroughly freshened, a damp cellar or unwholesome water will work damage to life. Only by judicious regulation of all the sanitary requirements can disease be prevented effectually, and health be restored most rapidly and soundly.

Measures of hygiene which return such great blessings to those who follow them, should receive the considerate attention of intelligent people. But custom and prejudice exert immense power over the human mind, and even in this enlightened age and country they thrust aside many of the dictates of reason. Sanitary regulations, like all other schemes for human benefit, have had to fight their way against habit and thoughtlessness, and have obtained recognition only after a long struggle. It seems very strange that the masses of men would oppose anything that promised to do them good; and yet the fact is one of history that it has taken three centuries of social warfare to establish the present degree of regard for hygienic laws. Every new step proposed was looked upon as needless, or as an absurdity, or an inconvenience, or an intrusion upon one's right to do as he pleased with himself and his family, or an opposition to the decrees of providence. And so the poor of England clung to their mud hovels and filthy rags as the birthrights of every Briton; and to-day the poor of America cling to their close rooms and crowded tenements and city filth as

the privileges of every son of freedom. Though much has been done toward the enlightenment of people on this class of questions, very much remains to be done. And in America we still need to instruct some of those who come from foreign shores that the safety of their neighbors is a sacred treasure which they have no right to destroy, and that the land of freedom does not license anyone to ruin the health of others by an importation of filth and an adherence to unsafe customs. Even among our native population and the best foreign communities, there is great indifference to proper sanitary observances, and too little willingness to consent to some degree of personal restraint on behalf of the public good, that will presently return a large benefit to the individual.

Preventive and preservative measures of hygiene are classed under three heads: Public, domestic, and personal. Personal hygiene relates to individual habits, and will be discussed in later chapters. Hygienic measures that affect the public also touch families, and may be considered together. Some of these have been treated of in the preceding chapters, but others require separate mention, especially as they cannot be carried out in towns and cities except by municipal action under the force of law.

Drainage.—By carrying off surface water, and also the ground water when this comes near to or on the surface (as in marshes), the soil is rendered more dry; and organic substances in it are speedily oxidized by the air that enters, and thereby rendered harmless. Both these effects are very desirable, improving the health of houses, towns, and large agricultural districts. In numerous low sections in our country, an extended system of drainage, undertaken in the interests of agriculture, has notably benefited the inhabitants and reduced the percentage of malaria and consumption. In Bureau Co., Ills., where more than 30,000 acres of swamp lands have been reclaimed by drainage, "the diseases prevalent have undergone a change, and some of them, that were a terror to the early settlers, are now but seldom heard of or seen." Similar results have been obtained in parts of Ohio, Michigan, New York and other States. Houses that could not be occupied safely because of dampness, may be made secure by thorough drainage below and around them.

Drainage instituted for the purpose of drying out the soil, is a different thing from a sewerage designed to remove filth; and the two systems of pipes should not be mingled, and especially should a sewage pipe never pass under a house. Drainage pipes are usu-

ally of porous material (as brick-finished tiles), allowing the water to pass into them from the surrounding earth. Their number should be increased as the soil is more retentive, a free common outlet to the entire series must be provided, and the openings must be secured against the entrance of small animals which may drag in materials in dry weather and stop up the drain.

Sewerage.—Pipes for the purpose of carrying off the filth from gutters, water-closets, sinks, factories, butcher-shops, etc., constitute a system of sewerage. The imperative necessity for this in large cities is well understood; but even in towns of moderate size the need of sewerage is important, though too often overlooked or postponed till some scourge that might have been prevented sweeps through and fills the houses with mourning. At another place (p. 22) I have presented tables illustrating the value of sewerage in twelve English towns. Prof. Von Ziemssen has lately shown that in many of the smaller cities of Germany a proper system of sewerage has reduced the number of typhoid fever cases more than 50 per cent., and so lessened the virulence of the disease in the cases which occurred that the death-rate from this filth-disease has been reduced to a mere fraction of what it formerly was. In other German cities, where sewerage has not been attempted, typhoid fever continues to carry off large numbers. Dr. Mapother states that in Dublin, where cholera used to make frightful ravages along certain sections, thorough sewerage of those localities has nearly expelled it from those places during later epidemics.

Sewerage pipes should be firmly glazed and their joints securely sealed, lest their fluid contents and noxious gases escape,—to the pollution of air and soil. Their size should be ample and the grade of inclination considerable, so that they may be washed out with abundance of water. An egg shape, with the smaller cone below, is more easily cleaned out, and gives less liability to lodgment of solid materials, than a round pipe; while a flat pipe is really not admissible. At suitable places and distances they should be provided with openings for the escape of gases, which should be carried quite above the house-tops,—though this is not yet attended to. Sewers should be thoroughly washed out—“flushed”—at intervals; and so should the streets and gutters of a town, that garbage, excrement and other organic filth shall not be left to putrefy. House-pipes connected with a sewer must be provided with ample water-traps as safety valves; and a small trap,

or one not flushed frequently, will soon have its water saturated with gases, which then will pass back into the house slowly.

Sewers may become sources of danger when improperly constructed, or when not thoroughly cared for. They should be laid on a bed of solid cement, so that the weight of earth above them shall not settle the pipes and open the joints. The joints should be secured in the most careful manner, and tested before being covered. No *direct* communication should ever be made between any water-pipe or cistern and a sewer, but a proper water-trap interposed at every point. Any suspected leakage should be remedied immediately, regardless of cost or trouble.

Removal of Excreta.—In most American towns and cities, this is done by the sewers, and the introduction of water-closets into private houses becomes part of the general system. Where the sewers have a perfectly free escape in a river, and the water-supply is bountiful, this may be done successfully. In time, however, the stream will be too much charged with such materials to be safe, and then will flow as a polluted water-course. If a town or city obtain its water-supply from that stream, depending on the purifying power of air (p. 56) to render harmless the vile substances thrown into it by the sewers of some town higher up, it will run a fearful risk. The germs of typhoid, cholera, and some other diseases, discharged from the bowels, may be carried long distances in water without their noxious properties being changed.

Water-closets in houses are conveniences, and are supposed to be a mark of the highest civilization. But they are sources of offense unless provided with an almost unlimited supply of water to flush them, and with basins and traps of perfect character. Great care should be taken to prevent their becoming offensive by continuously flushing them when in use, and by using proper disinfectants liberally. It is quite common to neglect this last item, on account of its trouble and expense; but it is a mistaken economy to save a few pennies a day by withholding disinfectants from a water-closet.

Vaults of some kind are the usual receptacles of excreta from private houses in villages and the country; and must continue to be so for the great majority of families. A shallow vault at a short distance from a house, may become a source of disease even in the open country. A deep vault, if in a porous soil or among stone strata (p. 57), will have its fluid contents percolate through the earth; and in time these may reach a well at some distance,

and pollute its water sadly. Care should be exercised in locating a vault, so as to provide against such a possibility ; but the correct course is to build the vault perfectly water-tight, and then empty it at moderate intervals. When a deep vault is covered closely above, and the house-pipes and water-closets empty into it, the accumulation of gases under pressure will at some time force these gases back through the water-traps into the house. The results of such vault (or sewer) gas slowly acting upon the inmates, will be disastrous. All such vaults, therefore, should be provided at the top with a small escape-pipe so laid as to conduct the gases in the dome of the vault quite above the highest chimney of the house.

Some further directions on this topic will be given when speaking of the management of the sick room ; but it may be said here that the safest plan for all out-closets is the adoption of the earth-closet system. By this, the fluid and solid excreta are mingled at once with dried and powdered earth or ashes, and all effluvia retained ; and then by emptying the pan or box regularly, the danger of impurity to air or water is prevented.

In country houses, it is important to keep animals at a considerable distance from the house. Droppings of hens, pigs, cows, etc., can readily accumulate ; and such accumulations may be so near a family well as to taint it through the soil, especially when heavy rains follow a long dry spell.

In cities, livery stables and stock-yards demand the utmost cleanliness by daily removing their accumulations and using water bountifully ; while saw-dust is employed to absorb the fluid discharges, and is removed promptly. Decay of such materials throws offensive gases into the air ; as does the decay of animal materials about slaughter-houses, markets, tanneries, and other places necessary in city life. Promptness in disposing of such substances is required ; but the details of such hygiene does not properly come within the scope of a book intended for families.

Milk Supply.—In country districts, the question of pure milk is one that never needs to be considered ; but in towns and large cities it has long been a topic of much importance, and the cupidity of men is rapidly making it prominent in the preservation of health. By carelessness in the dairies, unclean and improper milk may be sent to consumers ; but when cattle are kept badly and become diseased, the milk from them is a fruitful medium of conveying disease. Children suffer greatly from such milk, which

deteriorates rapidly in hot weather; and all ages and classes will suffer from it at any time.

That the milk of the cow will be affected by what it eats and drinks, is well known,—as when the animal eats onions, or has been treated to a dose or two of assafœtida. A peculiar and quite fatal American disease, called “milk-sickness” or “trembles,” is conveyed to families by the milk and butter of cows who have been poisoned by some unknown substance. Cattle confined almost the whole time in stalls, and fed chiefly by swill-slop from distilleries, become diseased in a few months, suffering bowel ulceration, consumption, etc. Such feeding increases the quantity of milk obtained, which is to the profit of the dairyman; but it spreads disease among all who use of the milk. Large numbers of cattle are thus fed near cities; and make it necessary that a public officer should vigorously abate such dairies as vile nuisances, inasmuch as individuals and families can not know where such dairies are and then protect themselves.

The foot-and-mouth disease greatly affects the milk, even to tainting with pus-cells; and such cells may be found in the milk several weeks after the animal has apparently recovered. Scarlet fever, measles and diphtheria seem to attack ill-fed and badly kept cattle, at least it has been fully proven that these diseases can be conveyed to children through milk.

Milk rapidly absorbs foul gases when kept in unclean cellars or other impure places. It is also quickly tainted by foul water, and it is not a myth that some dairymen add water to the milk they supply. In many instances, severe local outbreaks of typhoid fever in English and Scotch towns have been traced to the milk furnished by dishonest dairymen,—milk diluted with unwholesome water.

The Food Supply.—One important duty of town authorities, is that of regulating the supplies of food offered to the public. In the matter of *meats*, this regulation has grown into a pressing necessity and is likely so to continue. Diseased cattle, hogs and sheep are too often thrust upon the market, and demand careful inspection before their slaughtering makes it too late to detect the fact. That alarming and practically incurable disease conveyed by pork—trichinosis—is but one in the list that may be extended from animals to the human race. Among them are typhoid and scarlet fever, diphtheria, small-pox, and various diseases to which animals are liable. Some of these are developed in close stables,

by distillery slops, and by uncleanliness in the floors and in the water-supply to the cattle. Or they may be developed during the transportation of cattle over long distances, the animals being confined too long and thrown into sickness by lack of food and pure water. Infectious cattle diseases may be spread extensively. Unclean slaughter-houses may taint the meat hanging in them; or it may be kept too long before it is sold.

Butter is frequently adulterated with animal fats, which may in some cases be unhealthy. Old or rancid butter is not saleable; but its odor is often concealed for a short time by admixture with a little good butter and some chemicals. It is always a sickening article. *Coffee* is not only mixed with chicory, but a browned article has a nice polish given it by roasting it with a little arsenic. *Vinegar* is at times adulterated with diluted sulphuric acid. All such deceptious and dangerous foods require municipal authority for their inspection and rejection.

Arrest of Contagious Diseases.—This duty is now conceded to belong to the public authorities, to whom every possible aid should be given by private individuals. Suitable regulations and measures for this purpose will be given in the chapters on Contagions and Disinfectants. Vaccination oftentimes has to be made compulsory, a few persons professing to ignore the overwhelming testimony of *facts* and endangering an entire community by refusing to be vaccinated.

School Houses and Factories are proper places for public regulation. Numbers of persons are crowded together in such buildings for several hours every day, and thereby endanger the development and spread of certain diseases unless strict sanitary regulations are vigorously enforced by authority. Ventilation and heating have especially to be looked after, that a reasonable supply of air (p. 45) shall be provided for each person occupying the rooms, including a supply for the lights used in factories; and that the escape of the foul gases and emanations of breathing and combustion (p. 46) shall have free exit. Water closets and urinals must also be provided and kept scrupulously clean. Many instances have been recorded where sad outbreaks of diphtheria have developed from the vile condition of school-house vaults; and typhoid and typhus in severe forms have been traced to over-crowded and ill-ventilated rooms and unclean water-closets in factories. Personal greed seldom admits of a proper sanitary regulation of factories by the owners.

CHAPTER IX.

EPIDEMICS, INFECTIONS, CONTAGIONS.

Most of the acute diseases which afflict mankind, are likely to be more prevalent at some times than at others. When any malady assails an unusually large number of people in a district, or a city, or over a large area of country, it is said to be *epidemic*. Scattering (*sporadic*) cases of the disease may occur without it being particularly prevalent; but when the cases are so frequent as to quite outnumber those of any other one form of disease, it is pronounced epidemic in that place.

Epidemics of diseases that are infectious, or contagious, occur most frequently; but diseases that are not infectious may also be epidemic. Infectious diseases are such as seem to arise from some *specific poison*, as small-pox, scarlet fever, yellow fever, etc., because the disease resulting from exposure to them is always of the same general character,—an exposure to small-pox never producing yellow fever, etc. Some of these specific diseases are not at all contagious, as malarial fevers; some are decidedly contagious, as small-pox and measles; and some are contagious only under certain conditions, the least amount of the evacuations of a cholera patient seeming to produce the disease rapidly by the medium of water, while exposure to the breath and the surface exhalations will not produce it at all.

Epidemics have an apparent tendency to return at intervals, and then to traverse the globe from an easterly to a westerly direction. While such returns are not definite, and the direction of progress is chiefly from the dense centers of population to the newer and more open districts, the general facts have long been noticed. The causes of such periodic outbreaks are not altogether apparent; and in less enlightened ages they were attributed to visitations of Divine anger that was to be appeased by vows and sacrifices, to the influences of heavenly bodies such as an undefined connection between Jupiter and the spots on the sun, and to other equally superstitious causes. When we become more familiar with the facts, the true causes of epidemic returns will no doubt be made clear to us; meantime we are well acquainted with many things connected with their history, which enable us to at least greatly modify and limit an invasion of any special form of disease.

An epidemic is usually announced by some scattered cases of the disease appearing in a mild form, and then the outbreak upon many people is rather sudden and extended. Particular localities seem to give a home to some epidemics, as the river lines in warm latitudes to yellow fever, and the lowest quarters of cities to cholera ; and a place or section once severely afflicted with an epidemic is very liable to be severely afflicted at any subsequent visit of the same disease. The severest cases usually occur early in the visitation, and then its violence gradually abates, possibly toward the last attacking with great violence a number who had resisted exposure bravely. Persons who are in poor health, fatigued, ill-fed, intemperate and much crowded in their houses, are far the greatest sufferers ; but the most favorably situated will be involved, though much less seriously.

An epidemic is uncertain in its duration, sometimes lasting but a few weeks, as in a cholera outbreak ; at other times continuing for months, as in some typhus and typhoid visitations ; and occasionally hovering about for two or three years, as in scarlet fever. As it abates in one place it is liable to appear in another, and thus to extend over an entire continent, with various gaps between. A similar or a very different epidemic disease often appears among the lower animals at the same time and in the same sections ; but it is rare for two forms of disease to be epidemic among mankind at the same time. Not unfrequently, however, as one disease disappears after a protracted epidemic stay in a section, another follows in its wake—scarlatina sometimes following small-pox, and measles then following the scarlet fever.

Some epidemics of a disease occur in a mild form with few violent and fatal cases ; while another epidemic of the same disease is much more severe, and nearly every case is violent and an increased number of them are fatal. During an epidemic, other diseases usually present some of the signs of the one that prevails, and mingle with it. Thus when typhoid fever is at all prevalent in a place, all patients are liable to evidences of prostration, and during a cholera season looseness of the bowels will be common to many disorders where no intimation of actual cholera appears in the patients.

Every effect must be the result of some sufficient cause, and such momentous effects as epidemics must proceed from causes of no small magnitude. If these causes cannot yet be fully determined, the facts in epidemic histories are sufficient to show that

certain unsanitary conditions greatly promote the ravages of any epidemic disease. In every instance, (without exception), epidemics are most violent in character, most fatal in results, most extended in their development, in those localities and among those classes where unhealthful conditions prevail. Where filth abounds in over-crowded quarters, among the squalid and the intemperate, with whom ventilation is practically unknown and the general surroundings are vile, there epidemics find a home; and to such a home they delight to return at each visitation. But when such localities are thoroughly purified and kept clean by authority, and the water supply is improved, and the soil is rendered wholesome by drainage, and the residents are supervised in their habits, the subsequent visitations of epidemics find little foothold in these, their favorite haunts. Some places that had been almost uninhabitable by reason of typhus and typhoid epidemics, have been nearly freed from these maladies by proper sanitary measures (p. 22); and even the dreaded cholera has been in like manner driven from localities where it formerly raged.

So extended and uniform have been these results of sanitary regulations, that it is now proper to say that epidemics have been brought under check to such a degree as to be made comparatively harmless, and to offer good hope that they will presently be brought under full control. It is so apparent that unsanitary conditions provide them with the very pabulum on which they feed, that it is reasonable to expect them to disappear when such conditions are thoroughly corrected. In the case of infectious and contagious diseases, one may safely say that their appearance in a locality to any extent or with any severity is due to neglect of plain hygiene there. Unfortunately, in towns and cities, the very places where the foulest epidemics generate are occupied by the very classes who are most averse to practicing or to obeying public sanitary regulations. And from these localities and classes the epidemic malady will spread to no inconsiderable degree among those who are more intelligently careful. But that regard for the general good which is the true basis of all law, however much the private individual may object to any intrusion on his "personal rights,"—the demand for the *general good* should lead public authorities to adopt the necessary measures of hygiene for preventing all epidemics; and to enforce them long before the epidemic gets any foothold (p. 24).

While much remains to be learned about these stated and

epidemic returns of some diseases, the means of their prevention are pretty thoroughly understood and are in most respects the same in all cases. For this purpose the following rules are to be observed.

Preventing and Arresting Epidemics.

Maintain personal health in the best possible state. Whether the specific cause of the infectious or epidemic disease lie in the atmospheric gases, or in monads floating through the air, or in bacteria or other microscopic animals so small that 120,000 of them in length would not make an inch, the most potent resistive power to them all is a vigorous condition of health. We do not know the supposed new gases in the atmosphere, and therefore can not chemically make any specific application to them. We do not know whether the floating dust of the air is the cause of the epidemic, though this is possible; but we can not sift out or chemically neutralize it. We do not yet know whether the minute bacteria, bacillus, vibrione or other animalcule plays any part in causing the disease, or merely exists as an effect of disease that has started a destructive process in which these minute beings delight to find a nest. But we do know that they can not be destroyed except by a degree of heat (220° to 266° F.) that would destroy the human body, or by such poisons as corrosive sublimate and others that are more dangerous to life than the bacteriæ themselves.

But while we are at fault in all such speculative questions, and can drop them as affording no benefit to the human race, we find practical good in the plain facts that are well known. Healthy and robust persons resist all diseases most successfully, and suffer least when really attacked, and recover most rapidly with the smallest death-rate. Even the bacteria and bacillus so loudly talked about of late years, and described as constantly floating in the air by millions, are impotent to harm the healthy man and commit no visible degradations except on those who are already below par in the health scale. Nothing is more obvious, therefore, than the necessity of maintaining the best possible state of health in order to resist epidemic and all other diseases. This is to be done by careful obedience to those rules of personal hygiene which are hereafter to be given.

Cleanliness, purification, and temperance in all things, must be practiced steadily, if such a state of health is to be maintained. Also there must be no excess or irregularities in eating, no foolish

selection of certain foods to the exclusion of others (as ripe fruits and succulent vegetables) which the system needs. Above all, there must be no indulgence in any malt or spirituous drinks whatever; for such indulgence always lowers the standard of vitality and prepares the frame for the invasion of disease, and in every epidemic the most sure victims are those who resort to drink even in so-called moderation. In like manner, the use of any article as a prophylactic (as when belladonna is given as a prophylactic of scarlet fever, and camphor against cholera) is useless if not positively dangerous. If any parts of the system are already out of health, use proper remedies to restore the health of such parts; but to give an article to a person whose health is good, under the superstition that it will prevent the attacks of an epidemic influence which is wholly unknown, and which is not yet present in that person, is an absurdity of the baldest kind,—suitable enough to the ignorance of three hundred years ago, but not acceptable to the intelligence of this generation.

Some diseases that occur in epidemic form, strike many people with most irrational fear. In country districts, the appearance of a small-pox case usually paralyzes the population with a terror that would be amusing were it not so excessive. Men are almost bereft of good judgment, do the most unwise things, and often lose the common feelings of humanity. And in cities, while many are perfectly fool-hardy in a visitation of cholera, many others are terrorized at its approach, and are ready to "give right up" to any trifling nausea or looseness of the bowels that fear might construe into the first symptoms of the malady. Such inordinate fear is not merely unwise, it is itself dangerous; for it is well known that fear prostrates the system, and leaves it the more liable to the invasion of the very disease that is dreaded. It is well to be sufficiently apprehensive of danger, and take all sensible precautions vigorously; but most epidemics, be it constantly remembered, commit very few ravages among the prudent and cleanly, and nothing so contributes to healthful resistive power as a calm and self-reliant state of mind.

When a patient is seized with a distinctly contagious disease, he should be isolated as completely as possible. Where such persons are so situated that they can not be isolated at home, but notably expose other members of the family, and other families in the same house, a due regard to the safety of the others should make them willing to be removed to hospitals especially arranged

for such purposes. In Europe, this is quite commonly done ; but in free America the very name of hospital excites apprehensions of being subjected to experiments for the amusement of the doctors, and very few people will consent to go to one. Compulsory laws for the removal of the sick have not yet been attempted ; as public opinion in our country would not sanction such laws, even during an epidemic. If hospitals were not used for the exclusive advantage of one class of physicians, and the very poorest patients were at full liberty to enjoy the free services of any class of physicians they chose to visit them in an institution supported out of the public treasury, a principal cause of the bitter objections to hospitals would be done away, and the public would receive the benefits of such isolation during epidemics. There is a palpable injustice in using a public institution to sustain one class of physicians, and one set of medical opinions, and to exclude all others ; and this injustice practically deprives the poor man, when sick, of the right to care for his body according to his own convictions. He must submit his convictions, or lose the benefits of a place especially provided for him by the public purse. Tax-payers should correct this evil, which is totally opposed to the spirit of Americanism, and which is obstructive to medical science itself. Under honest competition, only the false will be driven to the wall, and only the true remain to enlarge science and to benefit the human family.

Treated at home, as most of these patients are, they should be placed in that room which can be most effectually shut off from the others. It should also be high up in the house, so that effluviæ which rise shall not endanger other rooms. Nurses should be selected from those who have had that malady, when possible, or who have no dread of it ; and in villages and rural districts the general community should provide such nurses if the family is to be isolated. Communication between the nurses and the other members of the family should then be broken off,—the nurses staying in a room opening into the patient's room, and through this receiving their necessary supplies and having egress to the outside of the house as desired. Such isolation, rigidly enforced, becomes irksome but is very necessary ; and by thoroughness in this, even the most infectious diseases may be treated at home without perhaps spreading to any other member if measures of disinfection are at the same time carried out.

Infectious diseases are many times spread rapidly through

schools. Diphtheria, scarlet fever and measles are often extended disastrously in this way—such a disease in a family being concealed and the well children continuing to go to school, and carrying the infection in their clothing. A family that is so regardless of the health and lives of others, should receive public condemnation and punishment. State laws now exist in many places, by which there is to be a forced report made to the authorities of every case of infectious disease; and such laws are beneficent, and every good citizen should heartily concur in them. Schools should be closed before any infectious malady appearing in a place becomes epidemic. And those who are so unfortunate as to die of such a malady, should receive sepulture in the most private manner. This will be assented to readily in regard to small-pox; but it should receive the same ready assent as to scarlatina and measles.

In the sick room itself, the most thorough ventilation and disinfection should be practiced. No direct draughts should blow over the patient in cool or cold weather, but open windows and fire-place should be arranged to change the air of the room freely. Nothing is equal to plenty of fresh air in diluting and rendering harmless the effluvia of any contagious malady. But disinfection must also be thorough in the room, its vessels, its bedding, the patient's clothing, etc. No bed-vessel should be used without incorporating strong disinfectants with the excretions, and purifying them afterwards. Neither should any excretions of such a patient be emptied upon the open ground; but should be emptied in an opening in the earth made purposely, and then abundantly mingled with earth and powdered charcoal. In the shallow vaults common through the country, such excretions should never be emptied in them; for they cannot be disinfected, and are liable to extend through the surface water and do grave mischief. In cities there is no alternative but to empty such excretions in the vaults; but these are deep, usually well lined with brick, and can be disinfected bountifully. The most suitable disinfectants for rooms and vaults are described in another chapter.

Full disinfection of the sick-room being practiced, the room can be ventilated outwardly without the least danger to others. In the terror that seizes some communities during a visitation of small-pox, it is often demanded that the windows of the patient's room shall be tightly closed. If those windows are on the lower floor, and open directly upon the street, ventilation through them would indeed be unsafe. But this is no position for

such a patient, and he should be removed to some other room. Even the foul virus of small-pox is made nearly harmless in the air of a properly disinfected room; and if it is an upper room, or one a short distance from the street in a village, there need be no fear whatever of its spreading by ventilating the room in the manner directed. In cold weather, which is the season when many epidemics appear, danger from such ventilation is still further diminished, cold being potent in disarming the virulence of most contagions.

Physicians visiting patients of this kind, are not at all likely to convey the disease to others. Their stay in the sick room is too brief to allow their own clothing to become infected, and they should not handle the patient or his clothing; hence the doctor is not in the most remote degree liable to have any infectious material attach to him. What little might be supposed to do so during a visit of fifteen minutes in a disinfected sick room, is dissipated in five minutes when he comes to the outer air. Facts innumerable bear out the assertion that the physician in the discharge of his duties perhaps never conveys an infection beyond the room, with the single exception that he may do so by handling a patient with the lower forms of erysipelas. I make this statement out of abundant observation; and from a desire to inform the public correctly on this question, as in the terror begotten by some epidemics they are disposed to treat with injustice the medical men who are devotedly risking their own lives for the good of the community. Yet it is advisable that the physician should, in an outer room, slip a loose wrapper (preferably of rubber or linen) over his clothing before going into the sick room.

After the recovery of the infected patients, the purification of the room and its contents must be thorough. Measures for this purpose are directed in another chapter. One of the precautions to be taken in all these cases, is against allowing any domesticated animal into the infected room. Children with scarlet fever or mild small-pox have often been pleased by being allowed to have a favorite kitten or dog let in to play with them. It has been too sadly proven that the fur or hair of the animal may thus become charged with the virus from the patient, and by it conveyed to other families, even at considerable distance; and the disease may appear among the latter in more violent form than among those who first had it.

In addition to this course of preventive management in the

house, there must be a system of public hygiene in the community. The appearance of any infectious disease in a locality should be considered as evidence that something is wrong there; and the nature of that wrong should be inquired into at once and corrected with the utmost promptness,—for *promptness* in public sanitation is the very soul of its effectiveness, and means the saving of a panic, of much expense and loss, and probably of many human lives (p. 23). Instead of concealing it and thereby jeopardizing their friends and neighbors, a family thus afflicted should be quick to take every precaution that will aid in curtailing the malady, and to give the authorities every information and assistance for arresting its spread. Such a course is a great benefit to the family itself, and may so aid in limiting the infection as to save many lives among their neighbors. Pride, or ignorance, or selfishness, or some equally unworthy motive, frequently leads families to conceal the affliction of a contagious disease which has come upon them, until it is too late to take effectual measures for its suppression, and many vacant chairs and mourning households attest the consequences of such criminal behavior.

Cellars, drains, sinks, vaults, and every point of possible decomposition, should be inspected thoroughly and purified in the most effectual manner. Streets, gutters and sewers must be treated in the same way, as directed in the chapter on disinfection. Such places, under public control, should never be allowed to become possible sources of infection, even in the most healthy times; for if a covered source of danger instituted by the authorities be allowed to get filthy from neglect, it is likely to become the promoter of an infectious epidemic that otherwise would not have existed. While, then, such places should be kept clean at all times, the first appearance of an infectious disease should be the note of warning; and competent inspection, with complete flushing and purification, should be instituted immediately and carried out vigorously, till every such place can be pronounced clean and free from dangerous exhalations.

By the use of these private and public measures of sanitation as demanded by reason, any epidemic can be robbed of its extreme dangers and greatly limited in extent and duration. Contagions of the more virulent class, as small-pox, may be restricted to narrow limits and a few families,—possibly with few or no deaths. So effectual are such measures, that Sir James Y. Simpson, of Scotland, used to declare that any contagious disease could

thereby be "stamped out;" and he was right. Even in diseases that return in a locality so regularly as to be considered entirely *natural* to the place,—as ague and other malarial trouble,—a correct system of drainage and sewerage will nearly eradicate them over large districts (p. 66).

CHAPTER X.

DISINFECTION AND DISINFECTANTS.

DECOMPOSING animal matter is such a fruitful source of disease, especially of infectious diseases, that the prevention of such decomposition is a hygienic measure of great value. Cleanliness and abundance of fresh air constitute the chief means of such prevention, but are not sufficient for all purposes. Arrest of the putrefactive processes, and destruction of the dangerous gases and organic substances resulting from these processes, need other measures. Such measures come under the head of disinfection; and include the use of means that (1) prevent decay in materials that are liable to decomposition, (as salt, sugar, alcohol, etc.,) which are called *antiseptics*; (2) those which render inert the substances that otherwise would cause disease, and which are *disinfectants* proper. All disinfectants are of necessity antiseptic. All chemical disinfectants now in use are more or less poisonous, some of them violently so; and it is best to use those which are least dangerous in handling.

Heat.—The virus of different diseases may be destroyed by heat, where this can be applied conveniently,—moist heat (as boiling infected clothing) being sufficient for some; but a higher heat and therefore a dry one being needed by others. Clothing and bedding charged with the virus of measles, scarlet fever, diphtheria, rotheln, glanders, and matters in the course of putrefactive fermentation, may be purified by boiling for an hour or two. If a quantity of salt is added to the water, so as to raise the boiling point a few degrees, the result will be the more satisfactory, a heat of 220° F., being effective in nearly all viri. In the case of the small-pox virus, however, it has been found that a heat above 230° F., continued for several hours, is required for its destruction; and blood that has putrefied yields a fearful poison that can-

not be destroyed under a heat of 320° F. Manifestly it needs the heat of the oven to do this; and one method of removing excreta, butcher's offal, tannery refuse, etc., where the sewerage system is not available or would leave the materials to putrefy at some point, is the very effective one of burning them in close ovens,—destroying the gases of such combustion by conducting them through water containing suitable chemicals. Clothing, carpets, etc., too foul to be disinfected, should be burned, openly or otherwise. In employing heat in an oven at 250° to 300° , to disinfect clothing, the articles are exposed for five to six hours. Dr. Ransom says woolen and cotton goods may be heated to 250° F. for seven or eight hours without injuring the fibre, though delicate colors will be altered a little; and cotton and silk goods may be heated to 295° F. for three hours without damage, but will be much injured in fibre if so heated for five hours.

Cold, the negative of heat, arrests decay; but the putrefactive changes are resumed when the cold is discontinued and a temperature of 55° to 100° F. is again reached.

Chlorine.—This is a potent disinfecting agent, and many of its chemical combinations are among the valuable articles of this kind. It is most commonly used as the chloride of lime, which should be bought as put up in boxes of one pound or less. Spread thinly in saucers and placed on the floor, and water added to it, the gas slowly escapes and permeates the room, destroying poisonous germs in the air. Large quantities of the gas could not be respired; but may be used to completely disinfect a room that has been occupied by a patient having an infectious disease. Removing the patient, and closing windows and doors, a pound or two of chloride of lime may be put into a large earthen dish, and on this poured an equal weight of sulphuric acid previously diluted with twice its bulk of water. It froths up quickly; and the mixing should be done instantly and the operator then hurry from the room. Good strong vinegar, a quart to the pound, will answer pretty well and will discharge the chlorine more slowly. So will a pound and a half of alum to a pound of the lime chloride. It will often change the color of garments in the room.

Chloride of Soda is employed in washing floors, painted walls, vessels, and clothing; acting similarly to chloride of lime.

Sulphurous Gas.—Burning sulphur emits this suffocating gas, which is one of the foremost of disinfectants for a tainted atmosphere. It is used in rooms from which persons have been re-

moved, a few ounces of sulphur or brimstone being thrown upon a basin of good live coals. This gas and chlorine neutralize each other, and cannot be used at the same time. *Sulphite of Soda* is an admirable arrestor of putrefactive decay, being dissolved in a little water and mingled with the offensive substances, or with matter liable to putrefy but where corruptive changes have not begun.

Carbolic Acid.—Of late years this acid and its solutions have been much employed for disinfecting. As deodorizers they are good; their own offensive odor filling a room and overpowering most other smells. But as true disinfectants they have been very much over-rated, being too mild to be of the first value; yet are good and reliable as antiseptics to prevent the decomposing processes, and the unpleasant smell of the carbolic acid is modified by mixing it with its own weight of camphor. A cheap and crude form of the acid may be used, dissolving it in water by good stirring. It is often mixed with copperas,—four pounds of the latter dissolved in a gallon of water being added to two ounces of carbolic acid previously dissolved in a gallon of water,—and furnishes a potent article. This acid is very poisonous, and will denude the skin.

Creosote is similar to carbolic acid, but not so strong. *Coal Tar*, from which both these substances are obtained, is a pretty good antiseptic and disinfectant in some places.

Copperas, Green Vitriol, Sulphate of Iron.—Iron preparations are reliable disinfectants, and this one is the cheapest and most usable. It is employed in solution, four pounds to a gallon of water being very strong, and one pound to the gallon answering most purposes in the sick room. Its principal use is on solid and fluid discharges that are liable to become offensive, or contain the germs of disease; hence it is much employed in vaults, sewers, and bed-vessels. *Chloride of Iron* is more costly, but is several times stronger than the sulphate. As all iron compounds stain the clothing, they cannot be used in cleansing such articles.

White Vitriol, Sulphate of Zinc.—On all solid and fluid discharges, and on all clothing tainted with infectious matters, this is one of the most desirable of all the disinfectants. *Chloride of Zinc* is stronger, and is even better than the sulphate. Dissolved in several times their own weight of water, they may be used in vessels, sewers, vaults, etc.; and for scrubbing and cleansing when diluted with twenty or more times their bulk of water. Being white, they have the advantage of not leaving any stain.

Permanganate of Potassium.—Manganese salts are nearly equal to zinc for disinfecting purposes, and are much less violent poisons. They make an intense purplish solution. An ounce of this salt to a gallon of water is a proper strength, and a few ounces of this solution thrown into a bed-vessel, or used to saturate cloths made offensive about small-pox, typhoid, and other infectious diseases, effectually neutralize their dangerous characters.

Lime.—Good quick-lime is only a feeble disinfectant, but is a good article to absorb moisture and certain noxious gases; and when used abundantly, as in whitewash, especially in rooms and outhouses that have first been disinfected with chlorine or sulphurous gas, it is an excellent purifying article. Broken lumps of lime are good to scatter in gutters and tainted cellars; but should not be used in vaults. *Caustic soda or potash* is a cheap detergent for scrubbing floors and other wood-work, and for adding to boiling clothing,—half an ounce or less to a gallon of water. *Sal-soda* is more generally used, because much cheaper and not so liable to impair the fibre of goods; but is not so effective. Lime and soda should not be used at the same time with zinc. Strong *lye* from wood ashes is a caustic potash solution.

A number of other disinfectants are in use, but the above are the most suitable. *Corrosive Sublimate* is potent, but entirely too dangerous to have around one's house. *Charcoal* in powder is a powerful absorbent of gases. *Blue Vitriol* and some other preparations of copper are active, but too costly for general use, while copperas and white zinc will do as well. *Alum* is a mild disinfectant, of good service in purifying some waters (p. 61); and a commercial compound known as *Bromo-Chloralum* is often useful in the sick room, mild in action, absorbing gases when cloths saturated with it are hung up in the room, and scarcely poisonous itself. Another commercial article called *Listerine* is much lauded but scarcely deserves attention. Other preparations are on the market, as *Condy's Fluid* (manganese), *Burnett's Solution* (zinc), which are reliable when honestly prepared; but some preparations thrust upon the public are nearly useless, and families would better buy in bulk the articles that I have commended, and then make their own solutions.

Applying Disinfectants.

The following directions are for using the different kinds of disinfectants, in the several places where each is most efficacious:

Rooms.—While a room is occupied, disinfect it by placing a

few ounces of chloride of lime with water in each of several saucers, and place them on the floor and table in different parts of the room, renewing every four to six hours. Or mix ten parts of fresh unslacked lime with one to two parts of fresh dry charcoal, and set large plates of it in several parts of the room. A few ounces of coffee roasted quickly, will remove bad odors for a time. Cloths dipped in water of chloralum, or solution of copperas or white vitriol, may be suspended in different parts of the room and re-wetted every two or three hours. Vinegar sprinkled through the room frequently, is refreshing and antiseptic; and more so if cloves, cinnamon and other spices are steeped in it.

If a room has been occupied by a patient with infectious disease, it is well to fumigate it. To do this, vacate the room, lift the carpet and spread it and other goods in the most open manner possible, take out tongs and other light metallic articles, and close all windows and doors tightly. Fill the room then either with chlorine or with sulphurous gas. For the former, use a pound or two of chloride of lime and disengage the chlorine with any acid, as already mentioned. For the latter, burn a pound or two of brimstone or sulphur on coals. Keep the room closed for ten or twelve hours; then open every door and window and ventilate thoroughly. After this, wash the floor and wood-work with water containing a pound of white vitriol to the pailful; and then wash the floor with water, in a pailful of which a half pound or more of caustic soda or potash has been dissolved (not touching this with the hands but using a mop,) and wash the other wood-work with four ounces of borax in a pail of water. Two pounds of sal-soda to the pail of water will do, if caustic soda or caustic potash *cannot* be had; but a very strong lye of wood ashes is practically the same as a caustic potash solution. After the floor has dried, give it a third washing with water and soap. Paper on the wall, if of poor and soft quality, should always be scraped off before fumigating; though this is not necessary when a good quality of paper has been put on smoothly, and especially if it has been varnished.

Vessels.—Chambers in the sick room should, when containing the discharges of patients, receive half a pint of water containing two ounces of copperas. Or half an ounce of white vitriol in half a pint of water may be used for the same purpose. Chloride of lime in water is best for washing out chambers and spittoons; and after being washed, they should be rinsed in water containing an

ounce of permanganate potassium to the gallon. Other utensils used in the sick room should be washed in this permanganate solution and then rinsed in pure water. All discharges from the patient should be removed at once.

Clothing and Bedding.—Cloths, towels, bed-linen, the patient's clothing, etc., should first be boiled in water containing two ounces of sal-soda to the gallon, for about two hours; then rinsed in clean water, and afterwards boiled in two ounces of white vitriol to each gallon of water, or else exposed for six hours to an oven heat of 250° F. When such articles cannot be treated at once, they should be covered with a solution of white vitriol—two ounces to the gallon—and then well rinsed in clear water before boiling with soda.

Mattresses and pillows cannot be well disinfected; and if of feathers or hair, it is dangerous to attempt to use them though ever so thoroughly treated with disinfectants. The ticking can be made safe by treating as other clothes, and then fumigating in the room; but small-pox and scarlatina poisons cling tenaciously to feathers and hair, and the only safe plan is to burn the mattresses. By pouring some strong nitric acid over them, they will burn more readily.

Privies and Cesspools.—Copperas and white vitriol are the best disinfectants for vaults, copperas being handiest and cheapest. For each cubic foot of contents, four ounces of copperas dissolved in a pint of water is a suitable proportion. In each gallon of this may also be dissolved half an ounce of crude carbolic acid. Two ounces of white vitriol are equal to four ounces of copperas for these purposes. When the contents of a vault are quite fluid, the copperas may be tied in a thin bag (using six ounces for each cubic foot of contents) and then suspended in the fluid to dissolve slowly. The foul gases of a vault are best neutralized by putting a pound of choride of lime in a good sized earthen vessel on a shelf under the seat, and pouring some vinegar or diluted sulphuric acid on this. Chlorine gas is set free, and being heavier than air, most of it falls down and disinfects the vault, a portion diffusing upwardly. It is generally necessary to repeat this at short intervals. No vault should ever be allowed to become offensive; and when its contents are to be removed, even when done by the present improved methods, they should be disinfected thoroughly as above, two or three days before.

Water-Closet Pipes should have poured down them a solution

of copperas, four pounds to the gallon; or of white vitriol, two pounds to the gallon. Half an ounce of carbolic acid may be added to each gallon of such solution.

Kitchen Sinks and Pipes are liable to get coated with offensive grease. This should be treated by first pouring down boiling hot lye, or solution of caustic soda; and then pour down a pint or two of either the copperas or vitriol solution (as above) two or three times a day till disinfected.

Outhouses and Cellars.—Places of this kind, which are liable to become damp, should have broken lumps of quick-lime placed in them, to be renewed as the lime slackens and crumbles. A bountiful coating of whitewash should also be given several times a year, and it is usually well to put a little carbolic acid in this wash. A fermenting heap of garbage or manure should have carbolic acid strewn over it, and then mixed in.

Gutters, Streets, etc..—After being well cleansed and “flushed,” chloride of lime should be sprinkled about, and copperas strewn in the gutters to dissolve slowly. Fresh lime may be used in these places, and should be strewn bountifully.

Stagnant Water should be drained off as quickly as a proper conduit can be arranged. Meantime it should be treated with a cold solution of alum made strong, and then with lime stirred into a thin paste (or “milk”) with water.

Kitchen Garbage, when it cannot be added promptly to a compost heap distant from the house, would better be burned at once. This can be done in the stove readily with all solid articles, and is the better course in towns and villages.

CHAPTER XI.

CLIMATE AND ITS INFLUENCES.

UNDER the term of climate are included the general peculiarities of a section as relates to its average temperature, prevailing degree of moisture in its atmosphere, the prevalance of strong winds or of gentle breezes, the steadiness of its weather through a large portion of the year, or its liability to sudden and severe changes, etc. Climate, therefore, is not altogether a question of latitude; for while the latitude of a place is a first consideration in

this question, the situation of a country or of a section as to its sea-coast or inland position, its elevation or its mountainous character, the dryness or moistness of its soil, its water supply, etc., will have an influence more or less decidedly modifying upon its climatic peculiarities.

Climate is known to have an important influence upon the vegetable kingdom. Warm and temperate and cold regions have their respective vegetable productions that are most natural to them; and these do not thrive if removed from the general climate to which they are naturally adapted, or cannot live at all—except under the crippling restraints of artificial conditions—if propagated in a markedly different climate. The peach is native to a warm and equable region; and produces luxuriantly and for many years, when cultivated within the range of conditions to which it is natural. Moved northward, its productive vigor and life are shortened, though still doing well in a sandy soil near the ocean where a northern winter temperature is modified; while producing fitfully and dying early in the same latitude inland, where the summer heats and winter colds are more intense. Far northward it cannot be raised at all.

The orange, lemon, fig, banana, almond, and many other fruits do best in a sub-tropical climate, and are merely hot-house curiosities in colder sections. Indian corn is native to warm lands, and dwarfs when taken far north, or refuses to produce seed in semi-arctic regions or in countries where there is not a prolonged summer heat above 85°. Apples thrive in widely different climates; but varieties that are best and most luxuriant in a rather high northern section, weaken when removed to the south and planted in a richer soil, while the apples native to Tennessee and South Carolina would make a sorry outcome after one winter of the blizzards of Iowa. Every farming community is familiar with these facts; and horticulturists are not so unwise as to attempt to raise products in uncongenial regions, and ruin themselves financially in the inevitable failure.

What is true of cereals and fruits, is equally true of trees, shrubs, vines, and all other vegetables. Certain growths are native to certain climatic conditions, including the temperature and moisture and winds of different elevations; and they cannot be transplanted to widely different conditions or elevations—whether northward or southward—without losing vigor and in time perishing altogether. When taken from one country to another, they will

thrive if placed in conditions similar to those from which they were removed, but will droop and die out if their surroundings are widely different from those to which they were native. Sometimes, after a series of years and under most careful husbandry, a plant or flower may be brought to adapt itself to a climate that is in a measure different from its native place; and after that has been done, will thrive in its new home, though not even then with the vigor and beauty that belonged to it in its native land.

What is true of the climatic influences over the vegetable kingdom, is also true over the animal kingdom; though the latter is much higher in the scale of creations than the former, and therefore animals can more readily than vegetables adapt themselves to climatic changes. Parrots are at home in the tropics, but could not live in the open air of winter even so far north as the latitude of Cincinnati; and the bobolink of the south, which pours its rich music on our ears in summer, hastens home to the rice fields of Carolina on the approach of the cold weather. Wild geese and ducks migrate northward and southward, at the changes of the seasons; but have been acclimated to high northern climes. And most animals, to whatever section they are native, may by care and by watchful provision in their surroundings gradually come to live and thrive in their new regions of habitation,—but this only after a series of years. It would be exceedingly interesting to study these influences upon animals in detail, for they have an important bearing upon the finances of a people; but space denies me this pleasure, and I allude to facts that are well known simply to suggest the general bearings of climates.

Influences that have such notable effects upon the vegetable and animal kingdoms, cannot fail to have a material effect upon man. As the highest in the scale of earthly creations, man is capable of enduring so much the wider range of differences in his surroundings, and of accommodating and adapting himself to new conditions. Nevertheless, marked changes in climatic conditions make themselves felt keenly upon man; and if not suddenly productive of disaster, they may slowly deteriorate the family stock or become endurable only after the lapse of generations. A native of Greenland would have a rough struggle for prolonged life, if suddenly taken to Brazil for a home; and a resident of Florida or southern Alabama would have a sorry time of it in the winter at Labrador.

But men make decided climatic changes in their habitations, doing so gradually and then slowly becoming suited to their new

conditions. Families and races become modified to suit their new surroundings; and in the lapse of time get so inured to them—as biennial wheat from the south has become inured to the high north, where it is annual—as to prosper under them in a modified way. Modern researches have given a curious illustration of these effects of climate upon a race. It has been shown that most of the nations of Europe are descendants of an Aryan race, moving from central Asia westward. The inhabitants of the Indian peninsula, Hindostan, are descended from the same Aryan parentage, this branch moving eastward and southward. Each branch of the one common family has become habituated to the new surroundings; and the physical and mental characters of each have been changed and developed by the lapse of centuries in their respective homes. So much have they, in the course of time, been modified by climate as to be apparently quite different races.

These two different peoples from the one ancient stock, are vigorous, hardy, prolific, and long-lived, in their present respective homes. But let one branch migrate to the home of the other, and we see at once that it requires long lapses of time to bring about the established characteristics that now attach to each branch of the Aryan family. "In these days, the Aryan races of Europe cannot rear their children in the climate of India, where their Hindoo relatives thrive and propagate their species. In Palestine and Egypt the Biblical records—those of the Pharaohs, and those of Ninevah and Babylon—show these regions to have been inhabited several thousand years ago by nations and tribes presenting precisely the same characteristics as those that now inhabit them. During the historical period, the races of Europe have in vain endeavored to colonize the valley of the Nile. But they have not been able to propagate their species, and have died away—leaving the valley of the Nile to its ancient inhabitants. Their children cannot withstand the heat of summer. On the north-eastern shore of Africa, history presents the same record. The Romans and the Visigoths occupied its plains for centuries, continually recruiting their colonies from their mother-countries; and yet, except in the mountains, all trace of their presence has disappeared. They could not rear their children so as to occupy the land of the Noahs. What lengthened periods of time must have elapsed to so profoundly modify races deriving their origin from a common parentage, that they can no longer live and propagate their species in the same climate!"—(Dr. J. Henry Bennet.)

Men instinctively cling somewhat closely to the general climate to which they have been accustomed; and in migrating, are seldom found wandering to any very great extent from the climatic characters incident to their old homes. As yet, however, the laws by which climates slowly change the characters of a race are not understood; and we must content ourselves with noting climatic influences as they show themselves upon individuals, either in producing or removing diseases. A principal consideration in these influences is the degree of protracted heat or cold.

Intense *heat*, or a medium heat that is long continued, throws a strain upon the liver, skin, and digestive system; hence tropical and sub-tropical latitudes greatly disturb these organs and promote liver troubles and indigestions. Remittent and intermittent fevers, dysentery, yellow fever, and the most severe and protracted forms of jaundice, are dominant in such latitudes. The digestive functions are sluggish; and the nervous system suffers alternating periods of excitement and depression that are far from being conducive to its healthy tone. Muscular activity is not easily maintained under such influences, and the people there resident become sluggish and indolent. In part this is favored by the ease with which the soil is led to furnish the means of sustenance, diminishing the need of that sharp struggle for existence which a colder climate demands. It is also favored by the nearly constant saturation of the system with bile elements, which always exert a depressing effect upon muscles, nerves, and mind. But the mere fact of high and prolonged heat is relaxing to the tissues, and lowers the common energies of the frame.

A large degree of atmospheric *moisture* in a warm climate, adds to its relaxing influence. As the rains near the equator occur during certain periods of the year, these rainy seasons give such a general depression to the system as to mark the sicknesses at such times with a tendency to hemorrhage, sinking, and putrefactive types. In the flat lands of tropical and sub-tropical regions extensive marshes and sluggish rivers make such sections exceedingly debilitating, and prolific of typhoid, typho-malaria, pernicious fever, and similar prostrating and septic maladies. Great *dryness* added to intense heat, as the belt beginning 12° to 20° each side of the equator, adds to the prostration of the nervous system, and enfeebles the heart and the general circulation.

Very *cold* climates, as in the high north, invigorate digestion, and cause a mode of life that develops the sanguine temperament

with a strong muscular system. Its climatic changes occur gradually. People occupying such latitudes are extremely hardy and enduring, subject to few diseases, and live to a good old age; but are sluggish in their nervous system, inclined to phlegmatic quietude, and often have severe diseases of the eyes from the glittering whiteness of the winter snows.

Temperate climates give the most distinct lines to the four seasons, and suffer the most sudden variations in temperature and in storms. As the southern edge of these climes is approached, the influences approximate those of the warm or tropical sections. As the northern edge is approached, the influences are similar to the cold climates; while the great suddenness and severity of changes in the weather common to most localities of the temperate sections put a heavy strain upon the lungs and kidneys. Such climates are prolific of consumption, catarrh, pleurisy, rheumatism, and neuralgias; and much the more so in places where the atmosphere is humid, where heavy fogs prevail during parts of the year, and where the soil is a moist clay.

Island positions usually have their temperature moderated, both summer and winter, by the surrounding body of water; on which account they enjoy a comparatively equable climate and are usually very salubrious. *Sea-coast* positions enjoy a stimulating atmosphere, but are commonly foggy in the cool months. *Elevatae* positions in the southern portion of temperate climes are often equable, moderately dry, free from malarial and typhoid tendencies, and greatly promotive of general vigor. Positions *inland* do not enjoy the moderating effects of the ocean on the temperature, hence are liable to get exceedingly hot in summer and correspondingly cold in winter. Large forests arrest the winter winds, and to some extent modify the summer heats by keeping the surface moist; and a large extent of clay surface-soil has a similar effect in the summer. Sandy and alluvial soils are drier and more retentive of heat than clay soils, and serve materially to elevate the summer temperature where they prevail. Because of the alluvial soil, absence of forests, and absence of large bodies of water over an extensive portion of our inland country, the summers of this large section are intensely heated, dry and dusty, and the winters have nothing to arrest the wide sweep of those fierce wind-storms now appropriately known as blizzards. These facts make our central sections very taxing upon the lungs, kidneys, and nervous system.

When one's purse can compass the expense, a change of residence for a few weeks, or months, or years, will often be of great advantage to invalids. New scenery and new social surroundings commonly furnish a relief and effect a change in the nervous system, which are of decided benefit to the sick. Sometimes a change of but a few miles, and without including any beneficial influences from climatic differences, works decided improvement. When the climatic conditions can also be made more favorable, so as to moderate or remove the strain from the organs that are in danger, the benefits of such a change may be very great in many cases of advancing disease, or of slow and uncertain convalescence.

In making a climatic change with a view to furthering the health, one needs to take under consideration a number of facts as relates to the nature of his disease and his present condition. Merely to "go somewhere," is a blind step and may add to one's danger. To go to a new locality without duly considering its average temperature, humidity, prevailing winds, pure air free from dust, sunshine without excessive heat, shelter, soil, water, and drainage, may be to plunge into more danger. To attempt a change and a long journey in a disease far advanced, might be to exhaust prematurely one's little remaining strength and thereby to hasten the fatal outcome. It is a great cruelty to tear one away from friends, and home, and the comforting attentions of those to whom he is dear; and to send him among strangers to do without the little tendernesses of a family, and there to weary and to die, when it is plainly to be seen that the change has been delayed too long to be of any use, and that death among strangers will probably overtake him under the exertions of the journey. People far advanced in years can rarely make any considerable change of residence, and should never make it if getting feeble.

The sea-shore is usually a stimulating and toning position, and increases the activity of the circulation and the respiratory organs. It is usually advisable for scrofulous tendencies, rickets, in convalescence from acute diseases, in chronic disease following acute ones, in bodily or mental overtaxing when the digestion is fair. In cases of nervous excitement, irritability, neuralgia and some forms of wakefulness, especially with indigestion, the sea-shore is not usually advisable. In the cold months, the shore can be sought to advantage only in mild latitudes.

A mountain climate, ranging from 1500 to 5000 feet according

to latitude, is of moderately dry atmosphere ; the air is more rarefied than nearer the sea-level, of lower temperature, and relatively cooler at night. It is promotive of a freer general circulation, greater circulation through the lungs, improved digestion and nutrition with consequent gain in blood-fullness and weight. Such positions are most suited to persons reduced in general tone and in flesh by over-work in business, literary pursuits and other mental strain, who have no real organic disease, and who have a goodly share of muscular activity. To such persons, as to many convalescing from acute diseases, its pure air and opportunities for moderate exertion are peculiarly valuable restoratives and tonics. Such positions are also finely adapted to persons with narrow chests and weak lungs inclining to consumption ; to young persons of this build who are growing too rapidly ; and to chronic tendencies to consumption, or actual plthisis,—which diseases are much relieved in summer by the prevailing coolness of mountain air as compared to the intense summer heats of lower districts. Mountain climates should be avoided by persons suffering from chronic rheumatism, heart disease, organic kidney diseases, and chronic bronchitis ; also by aged people. High elevations generally give immunity from hay-fever, cholera, malaria, yellow fever, and other infections.

Wooded districts, as already intimated, are cooler and moister than the open country ; and afford considerable protection against winds. They have a general soothing impression on the nervous system that is desirable in many cases of nervous excitability and hypochondria ; and also in bronchitis, and in the earlier stages of convalescence when sea or mountain air is too stimulating. But in seeking a wooded district, caution must be exercised against a locality that excludes the sunshine too much. Whatever advantages may be obtained in an equable temperature and moderate winds, nothing can compensate for the presence of free yet tempered sunshine (p. 30). To exclude that, is to invite decay. It is repeating the folly of the consumptive patients, who many years ago took up a residence in Mammoth Cave, Ky., because of the peculiarly even temperature that prevails there throughout the year. In seeking one sanitary condition, they lost sight of another that was thousands of times more important to them,—sunlight. In planting groves near prairie houses to break the violent winds of those sections, a similar danger is too often courted. It is well to check the fierce winds ; but if this be done

by planting the trees too thickly and too near the house, the dullness and dampness in the house caused thereby will be immeasurably more damaging to the health of the inmates than the winds need to be.

A southern climate has the great advantage of permitting a patient to be in the open air a very large portion of his time. Its milder temperature and generally drier air also help protect the lungs and air-passages from fresh inflammatory attacks. But it has the disadvantage of being relaxing; and persons with acute diseases of the respiratory organs, daily fever, excessive weakness, or requiring to remain much in bed, should not remove to the south. Once it was all the rage to send consumptives to Cuba, Louisiana, or Florida; but it was a disastrous folly. Mental disease with excitement should not be sent south. But chronic bronchial and laryngeal diseases, which do not endure the rough winter winds of the north, can be sent to the south with great advantage on the approach of winter, returning northward by easy stages as warm weather advances. When the bronchial expectoration is profuse, a dry section is to be sought; but when the sputum is scanty and the air passages are irritable, a somewhat moist location is to be preferred.

Northern latitudes are seldom sought for the purposes of health, except through the brief months of a northern summer. Most northern sections are toning to an excellent degree, and are suitable for most convalescents. If the section is a moist one, or, subject to high winds, it will be peculiarly unadvisable for weak lungs or for chronic rheumatism. A dry northern section is many times of decided advantage to lung troubles, but not to bronchitis or throat disease.

Sea-voyages are sometimes undertaken for the improvement of health. When the troubles proceed from the digestive organs and liver, such voyages are likely to do much good and to prove greatly invigorating. Indigestion from mental over-strain is doubly benefited by such a voyage, the nervous system recovering its tone by the rest and quiet usually obtained on a voyage. Some years ago I enjoyed an amusing story from the pen of an eastern editor who was suffering from the horrors of nervous dyspepsia, and took a short trip on a fishing-smack to relieve his stomach and keep him from suicide. After going through the torments of seasickness for several days, he began to recover appetite and digestion, and in less than three weeks could beat the "boys" in "stow-

ing away" a large meal of mixed potatoes, fat pork, fish, and sea-biscuit, known by the euphonious Yankee name of *flummrididdle*.

But while a sea-voyage will pretty thoroughly renovate a man whose difficulties and prostration proceed from the stomach as a centre, it is not advisable for all ailments. Persons may suffer such prolonged sea-sickness, from which they obtain no respite, that a voyage utterly exhausts them. Nervous diseases of the irritable class, and some highly nervous organizations, are made worse rather than better by a voyage. Such persons are not able to be much on deck, and so miss that life in the open air which is one principal advantage of a voyage. Confinement to the cabin or state-room is exceedingly wearying to all such persons; as also to consumptives, and to all whose conditions or general strength does not permit them to remain on deck in the rough weather that all must expect on the ocean. Young women going on a voyage generally have some menstrual disturbance, especially suppression for some time after; but this is no detriment to them, rather securing a nerve-rest that proves beneficial. Women about the change of life, if fleshy, generally make decided gains by a sea-voyage.

In removing one's home to a new section, even while preserving the common latitude of his old home, he will usually find his system affected by the new surroundings. The soil, water and atmospheric conditions are likely to be different; and after a few weeks he will probably feel the change, and continue to feel it in some degree for several months. In due time he becomes accustomed to the change, and feels no further disturbance from it. These facts are so well known, that every person making such migration expects to go through a period of acclimating. This is made shorter or longer by one's own habits, as well as by the natural healthfulness of the new locality. One removing to a malarial district is liable to suffer long and severely; but going to an elevated district causes slight and brief disturbance. A few general considerations should be remembered:

In removing from a northern to a southern section, the change should be made in the cooler portion of the year. Soft woolen undergarments should be worn, as the nights are frequently cool. A good appetite must be restrained firmly, the diet made exceedingly plain as well as moderate in amount, and meats reduced to a minimum. Stimulating articles must be avoided; and mental and bodily exertion be lessened from the activity that prevails in the

north. Great caution and moderation are needed in the use of southern water in almost every section.

In going from a temperate or southern latitude to one far northward, the summer or early fall months should be chosen for migration; for even the healthy may suffer if such a change is made in winter. The clothing must be of the warmest character, and the chest and abdomen must especially be protected. The diet is gradually to be increased in its meat portion.

When persons move to a malarial district, or visit one for a short time during the summer months, it is very important for them to keep in-doors after sun-set, and until the sun has dispersed fog and dew in the morning. Also to keep a little fire on an open hearth or grate in the evening, to boil and then filter all the water they drink, to avoid heavy exertion during the heat of the day, never to be so thinly clad as to allow themselves to get chilly in the evening, and to use meats and fats quite moderately.

CHAPTER XII.

HEREDITARY TENDENCIES AND INFLUENCES.

IT has long been known that certain peculiarities are likely to continue in families from generation to generation. "Family likeness" is often very marked from father to son successively, a grandson or great-grandson so closely resembling his ancestors as to be a slightly modified repetition of them. Even throughout a nation, a certain type of features will be stamped upon it and distinguish it for centuries through every change of clime and circumstance. The peculiarities of the Hebrews are known everywhere, and as revealed by history are virtually the same to-day that they were in the time of Abraham. The German impress holds the same marks that belonged to it in the remote past; so does the Irish, the Chinese, and the Negro. Where nations mingle and inter-marry, the separate characters dissolve into each other and become modified in various degrees,—the stronger character giving the more dominant impress. Where different *races* intermingle, the race having most of the sanguine-lymphatic mixture of temperaments—most animal force and propensities—retains its characteristics longer than the one having most intellectuality or nerve force. This is

notably true in the miscegenation of whites and blacks, the more sensuous blacks giving to the progeny their dark skin, flat nose and protruding jaw, even where one-eighth or less of the blood is from the negro side of the house.

But bodily deformities as well as general peculiarities are thus transmitted. For four generations, the English family of Lamberts was excessively corpulent; and was also known as "the porcupine men." Their skin resembled the bark of a tree, and about the abdomen and flanks "looked and rustled like the bristles or quills of a hedgehog shorn off within an inch of the skin." An extra finger or toe has been transmitted in a family for eight generations; and a certain misshapen limb, or blotched skin, or other partial disfigurement has "run in families" for a long time. So have certain distinct peculiarities of look, of voice, of manner,—the very tones, expressions of countenance, motions and gestures, being plainly repeated. Sometimes a characteristic that has belonged to a family may disappear in a child, but is quite likely to appear again in a grandchild. A child may "take after" the mother and the mother's side of the house in its features and emotional faculties, and after the father and his side of the house in its physical make-up and intellectual proclivities. Some families are notably "long lived," others "short lived."

This tendency to transmit peculiarities of body and mind, while recognized in a general way and in certain directions, is more potent than it is commonly thought to be. It has a strong influence on individual constitutions,—one descending from a "long lived" family and possessing the general characters of that family, being endowed with a density of structure and an enduring capacity that are likely to bear him triumphantly through alarming diseases. It also has a strong influence on individual developments,—giving a certain line of mental brilliancy, or a certain type of genius (literary, artistic, oratorical, mathematical, mechanical) for generations. In fact it is well proven that every quality of body and mind tends to transmission from parent to child. Personal habits and modes of life, aided by associations, surroundings and education, will gradually modify or change such family peculiarities, or in time develop others which in their turn will be transmitted; but the *tendency* toward the transmission of what belonged to the organic qualities of the parent, is always strong.

Sound constitutions and vigorous qualities of mind being thus handed down to children and grandchildren, unsound or distorted

constitutions and perverted or enfeebled qualities of mind may be passed onward in a similar manner. Here opens a theme which has an important bearing upon the perpetuity of families and the welfare of the human race. Some forms of disease are known to be transmissible, and this in a marked degree. A disease in its open manifestations very seldom descends to the child; but the offspring receives from the parent such taints of bodily unsoundness as incline toward the malady that afflicted the parent. With this bent in a certain direction engrafted upon the constitution of the child, the adverse surroundings and influences of its life may not be resisted successfully; and if these become numerous and active, and especially if they favor the development of the line of disease toward which the child already has an inherited bias, that disease will sooner or later be brought into full development.

If but one of the parents has a disease-taint, the child or children which resemble that parent will have the same proclivity; while those children which resemble the more healthy parent will probably escape. If the same or a similar morbid inclination exist in both parents, the children will be quite sure to exhibit that tendency in a yet stronger degree. A child may not especially resemble either parent, but exhibit the peculiarities and the diseased tendencies of some uncle or aunt.

All forms of disease are not equally transmitted, and a considerable number can scarcely be called transmissible. Lighter tendencies are easily overcome by proper obedience to the laws of health; the stronger ones can be overcome in large measure, and even be eradicated in three or four generations. It should never be considered, therefore, that the development of a family tendency is inevitable; but rather that the vital qualities of the frame always favor a restoration to a sound constitution (p. 19); and will in time succeed in this endeavor when properly assisted, but will fail when opposed and thwarted by one's own modes of life. It is true that a certain hereditary predisposition inclines one to do the very things that most readily harmonize with that bias and thereby intensify it. But this, in turn, is not a predetermined necessity. Reason should sit enthroned as the supreme guide of every man and woman in all temporal matters; and that reason should be used to search out and make known any hidden and dangerous tendencies of one's constitution, and to then firmly and steadily guide the life for the overthrow of these and for the development of an untainted body.

The following classes of disease, in the order of their naming, are those toward which a tendency is most frequently transmitted:

I.—Constitutional diseases; among which are consumption, scrofula, rheumatism, gout, cancer, syphilis, etc.

II.—Disorders of the nervous system; in which very large class are included St. Vitus' dance, epilepsy, neuralgia, hysteria, sick-headache, hypochondria, and insanity. Also apoplexy with paralysis. In this class also belong various mental peculiarities, such as a passionate disposition and a lascivious inclination. It also includes a passion for strong drink,—a passion often propagated in the child by a drinking father or mother, and in the offspring being easily fed into an abandon of drunkenness that is a mania.

III.—Deformities, malformations, and some diseases of the skin. Among these are squinting, cataract, long or short sight, color blindness; deafness, lepra, psoriasis, and such skin troubles as are often suffered in direct punishment of vice. Premature baldness and greyness also frequently run in families.

Additions might be made to these lists, but the catalogue is sufficiently extensive, and embraces some of the most intractable difficulties. Be it noted that the *constitutional* diseases are most sure of transmission.

If a malady has appeared at a certain age in the parent by whom it is propagated, it is likely to develop about the same age in the child upon whom the predisposition thereto has been impressed. If both parents have propagated the tendency, it will be apparent earlier in the offspring as well as more intense. Sometimes the malady of the child is not specifically the same as that of the parent, though in the same class; and may be either less severe or more severe, according as the health of the parent was improving or failing at the time of the conception. Thus, an increasing hypochondria in the parent may appear as insanity in the child, or a degenerating epilepsy show direct mental aberration in the offspring. A parent with epilepsy that had materially improved, may transmit only nervous irritability and sensitiveness to the children; while even an exceedingly mild and occasional epilepsy in both parents, is liable to end in idiocy in the children. A father recovered from syphilis may become the parent of children who exhibit no taint of the malady; if he has but partly recovered, his offspring will be notably damaged by the taint; while if both parents have suffered from the contagion, and seem to have been cleared of it, there is yet a strong probability that any chil-

dren born to them will present some of the remote yet distinct constitutional wreckage of the malady. A child may be impressed at birth with some transmissible disease, as consumption, but present no evidences of it then, nor until or shortly after puberty; and it might escape altogether, were not some unfavorable influences—as a dark and damp house or exposure or an exhausting mode of life—allowed to work their evil impressions.

Sometimes a child will live and die without showing any of the diseased tendencies of its parents, and then that child's children develop those tendencies. This corresponds to the fact that children sometimes do not resemble a parent, but have a strong likeness to a grandparent or even a great-grandparent. The "family likeness," and the family peculiarities and mental proclivities, have missed one generation, or even two generations, to appear distinctly in the next. Likewise certain diseases, escaped in the one, may appear in the next. Such returns after a brief lapse, are called *reversion* or *atavism*; and show the force with which personal conditions may be propagated. Not all maladies, however, will exhibit this power of remotely appearing, but chiefly those which most nearly touch one or the other of the three great life-centres—brain, lungs, heart. Hence, gouty and rheumatic diseases, belonging to the circulation, are liable to atavic developments, though care for two generations will probably eradicate the tendencies. Consumption belonging more directly to one of the life-centres, is liable to exhibit itself unexpectedly after it was supposed to have been overcome. Insanity in some of its many forms is still more likely to crop out suddenly, even after the lapse of three generations, when the mental strain thrown upon the individual is of a kind to favor the especial line of aberration that afflicted the ancestor. So durable are both good and ill qualities when these have become engrafted upon the constitution, that observation of the common facts around us will convince us of the truth of the English belief that "blood will tell."

But while this topic is one of great interest, let us not forget that every propagated malady had a beginning with the ancestors in some decided violations of physical laws; and they and their children and their descendants suffered, and continue to suffer, the penalty of such lawlessness. And a similar course of disobedience will to-day develop consumption, epilepsy, insanity, or any other disease where no trace of it existed; and send it speeding on to afflict and blight those who come after.

CHAPTER XIII.

CHARACTERS AND INFLUENCES OF TEMPERAMENT.

It has long been observed that men might be grouped in a few classes, according to the predominance of certain structures; and that particular forms of mental and emotional activity usually accompanied certain physical organizations. Such habits of mind, or "temper," thus came to be estimated by the bodily conformation; and to the latter was thence attached the name *temperament*.

Divisions according to temperament are arbitrary, and yet have a degree of reality that makes them useful. Galen several centuries ago divided the temperaments into the *hot*, the *cold*, the *moist*, and the *dry*; and these again into four mixtures,—the *hot and dry*, the *hot and moist*; the *cold and dry*, the *cold and moist*. More recently the divisions have been the *Sanguine*, corresponding to Galen's hot and moist; the *Nervous*, Galen's hot and dry; the *Bilious*, Galen's cold and dry; the *Lymphatic*, Galen's cold and moist. No temperament can possibly exist alone, but the term merely points to the predominance of certain groups or classes of structures; hence a temperament that is especially marked is associated with the other temperaments in varying degrees. When neither temperament is dominant, all four of them presenting a quite even development, the rare condition marks the perfect physical man. An excessive predominance of either one, gives a certain exaggeration to the bodily configuration and eccentricities to the mind.

The *Sanguine* temperament (also called *vital*) includes persons with large arterial development, giving them a full chest, full and strong arterial circulation, a ruddy complexion, prominent muscles and general fullness and warmth of body. They are energetic, active, restless; love out-of-door life, freedom and enterprise; are rapid and easy in motion, strong, courageous, but lacking the persistent endurance of the bilious temperament; and are hearty eaters. Mentally they are brilliant, versatile, rapid, clear-headed, quick of imagination, impulsive, vivacious, turn easily from one line of thought to another, chafe under restraint, love independent action, will not long be satisfied with any secondary place, are pioneers in thought and action, naturally lead and dominate other men, but usually lack patient continuity in a business pursuit.

From the predominance of the arterial system in this temperament, it gives an equally strong tendency to disturbances of the circulation. Inflammations and active fever develop in them rapidly, are very intense, but not dangerous in proportion to their intensity. They pass rapidly through the ordinary course of disease, and recover with a sudden rebound; are liable to general inflammatory rheumatism, gout, hemorrhages, sudden and severe headache, and to contract congestive diseases.

The sanguine temperament may be lessened by a large use of vegetables and limited of meats, and gradually falling into habits of close study or hard work. It may be developed by an out-door life with moderate labor, and increasing the use of fresh meats gradually. Its development is usually very desirable. Years are required to make any especial change in a temperament.

The *Nervous* temperament (called also the Mental or Encephalic) gives a large brain, slender muscles, soft hair, and general sparseness of build with a narrow chest. All the structures are delicate and the features rather sharply outlined. Acuteness and intensity of feeling, sensitiveness exceeding the provoking cause, great nervous energy, quickness and even abruptness of motion, are the common characteristics. Mental pursuits are delighted in, and mental activity is great and capable of persistent exercise. These are the leading thinkers of the world. Such persons do not love muscular labors, and are out of place in any calling demanding hard work; yet often are very enduring under privation. They are not necessarily "nervous" in the sense of being diseased; yet are strongly predisposed to neuralgias and other disturbances of the nervous system, spinal troubles, brain disturbances, protracted excitement or delirium in fever, constipation involving both the bowels and the liver, and to lung diseases. Their arterial system is small, and often they resist cold very poorly.

This temperament may be restrained by giving less time to reading, thought, education, and mental pursuits in general; and cultivating more ease of motion, less haste in thought and action, and following light labors out-of-doors when possible. It demands constant efforts to balance it with the bilious and lymphatic.

The *Bilious* (Motor) temperament gives unusual prominence to the bony structures, the frame being broad and angular, the joints and cheek-bones prominent, the shoulders square, the muscles solid and of strong outline, spare or almost emaciated in flesh, all the tissues dense and firm. The hair is usually dark or black,

and coarse ; the skin dark and inclined to sallowness, whence the name "Bilious." These persons are fond of heavy tasks, and exceedingly enduring ; strong and tenacious in will-power, of few sensibilities, blunt in methods, often morose, slow and plodding. They are strongly inclined to liver troubles of all forms, to obstinate dyspepsia, constipation, chronic rheumatism of the joints, and melancholy. They develop the symptoms of disease slowly, and then these symptoms are very tenacious and deep. A certain grade of fever or of mental disturbance is more serious in them than in the preceding temperaments ; acute attacks of disease are prolonged, and chronic diseases exceedingly persistent ; yet these people are very tenacious of life. Steady muscular exertion in good degree, aids in strengthening the tissues and promoting this temperament,

The *Lymphatic* or Phlegmatic temperament gives fulness and rotundity to the body, with a large and heavy frame, large hands and feet, and general bulkiness and coarseness. It imparts slowness and sluggishness to the system, and to all physical and mental operations ; and acts as a safe balance or restraint when combined with the fiery sanguine or intense nervous temperament. It inclines, when strongly marked, to favor the development of chronic diseases of the scrofulous class, to faulty general nutrition, and to limited resistive force in acute disorders.

According to the relative proportions of the several temperaments in combination, the characters of the body will be varied and the tendencies to disease altered. The sanguine gives the greater prominence to the spinal system, the nervous to the brain, and these two are associated with the highest quality of all the tissues. The combination of bilious with sanguine usually gives a strong hold of life, if the lymphatic is also good ; but nervous with full sanguine and some lymphatic is often equally tenacious, and the longest lived people commonly offer this combination of temperaments. Nervous and bilious combined are generally enduring, yet often look much older than they really are. Bilious and lymphatic give steadiness, breadth and force of character ; but are not often long-lived.

In making a general estimate of the enduring qualities of a person, of their power to resist disease and rally thoroughly from it, of the probability of their reaching a good old age under favorable circumstances and habits, the following features make the most desirable combination : A stature not far either way from the

average of 5 feet 8 inches for man, and of 5 feet $3\frac{1}{2}$ inches for woman. A weight not varying much in either direction from the medium range of 145 to 180 pounds for men, and 105 to 130 for women. A capacious chest that is round and long rather than flat, with a range of about 3 to $3\frac{1}{2}$ inches in measurement between forced inspiration and forced expiration in men, and of $2\frac{3}{4}$ to $3\frac{1}{4}$ inches in women. Shoulders that are round rather than flat. Abdomen full but not projecting. Head not too large in proportion to the rest of the body; neck of good size, but not too long nor too short; hand large and thick through the palm without the fingers being too deeply cleft; foot thick and broad, with a good arch under. Hair light or sandy in early life, changing to brown in middle life. Skin smooth and strong; complexion only moderately ruddy in youth and not too florid in middle life. Pulse of good size, regular, firm in feeling, and having the following range of beats per minute at the respective periods of life,—the person sitting down and quiet: At the sixth year, about 100; from the sixth to the fifteenth gradually lessening to from 80 to 90; from fifteenth to twenty-fifth year, 80 to 75; from twenty-fifth to sixtieth year, 75 to 68. The nervous and sanguine temperaments give the higher ranges of frequency; women have a range two to four beats more per minute than men of the same age and temperament; standing up increases the number of beats from four to eight per minute above the sitting posture; men of extra height have a slightly slower pulse than men of average stature.

Some persons are spare and delicate-looking, yet show an unexpected tenacity of life. These will usually have large knuckle and other joints, rather high cheek-bones, and considerable breadth between the ears (the base of the brain). Persons of this build are always enduring. On the other hand, tapering fingers, small knuckles, smooth and indistinct joints, tapering shoulders, low cheek-bones and narrowness between the ears, are marks of physical structure that do not promise high powers of endurance.

CHAPTER XIV.

MARRIAGE AND INTERMARRIAGE.

In view of the facts and laws connected with the propagation of diseases and their descent in families, the question of marriage has a bearing that is too seldom considered. Young people thrown together in society, and finding in each other qualities that elicit the deepest and most sacred of all emotions—love, are seldom inclined to examine any physical question of adaptability. While the one natural and desirable outcome of their marriage is a family, they rarely admit this thought to a moment's consideration in courtship. During those pleasant months, they study only their personal and present happiness; and the question of the influence of their respective constitutions upon the children they beget is not at all likely to be reflected upon, even if the mere thought of having children is not swiftly banished from the mind as immodest.

It would be far better for the human race, for the family connection, and for the young people themselves, if this topic were reflected upon calmly before entering wedlock. Better consider the physiology of marriage and the laws of heredity before entering upon these attachments and sacred relations, than to assume them where the physical laws would forbid and then be the unhappy parents of a weak or diseased family of children. The liability to propagate many diseases can be overcome, in a considerable measure, by rigid obedience to the laws of life; though the people who will not consider these matters before marriage, are not usually inclined to study and act upon physiological teachings after marriage. But some diseases can scarcely be overcome until "the third and fourth generations" have been passed in the most careful manner, and even then perhaps only through a *succession* of physiological marriages that would be most rare. Meantime it is probable that many premature deaths have taken place, and much sorrow has been endured thereby.

Women, who depend upon the other sex for entering the married state, are probably least inclined to consider this question, although they are the great sufferers through its neglect. It is Rachael, not Jacob, who weeps for her children and refuses to be comforted because they are not. It is the mother, not the father, who never can forget or cease to mourn over an afflic-

tion in the family. Where the father grieves, the mother agonizes; where the father recalls with sorrow, the mother never abates the poignancy of her grief. To the man it is important that his home shall be guided by a loving, tender and healthy wife. To the woman it is thrice important that the father of her children shall be strong and healthy and true; and that he shall be free of any taint or vice from which may be transmitted to her offspring the seeds of consumption, or syphilis, or epilepsy, or dementia, or of insanity, or the inclinations of a profligate, or the appetite for strong drink that turns the home into a daily hell of despair.

Both parties to a marriage contract should examine thoroughly into this matter before making such a contract. They should investigate it while the question of mutual attachment is as yet only among the possibilities; for then the investigation can be made calmly, conscientiously, sincerely,—without bias from any hidden emotion, without compulsion from an engagement already entered into. When the heart's deep feelings have once been drawn out, or when the attachment has been formed and the word of troth has been spoken, it is usually too late to make any judicious inquiry upon these matters, or to attempt their unimpassioned solution. Man, as the stronger party, and the active force in courtship, should in honor avoid eliciting any woman's affections, unless he knows he can offer her the same untainted family and personal constitution that he should find in one he obtains as his wife. Woman, as the chief sufferer under marital mistakes, should be thoroughly assured of the soundness of body and of mind in the man, and in the family of the man, whom she accepts as a husband.

Such inquiries should extend back for two generations, and include the several members of the family on both sides. Love generally refuses to examine into such questions, as being too cold and calculating for strong feeling; but when love acts without consulting reason, it is indeed blind and usually pays a fearful price for its ventures. A business contract, which merely concerns property, is made with the utmost circumspection; how much more careful should men and women be in entering upon a marriage contract, which involves their own existence and the welfare of those whom they beget. No man has a right to hand down to his children, from a mother, an entail of hereditary tendencies that may render them miserable through life or hurry them into

premature graves. Nor has a woman any right to inflict such disasters upon her offspring, by completing the marital alliance with a man tainted with some transmissible disease or habit.

A few plain facts will be sufficient to guide judicious people in this matter. Persons who strongly resemble one another in build, complexion, and other details of temperament, have similar liabilities to disease; and if they have any children, these will be very liable to be delicate and to die young. If either of such parents is tainted, though but moderately, with a transmissible disease, it will be certain to develop sharply and disastrously in the offspring. A combination, in matrimony, of temperaments that are fairly contrasted,—as between nervous-sanguine and bilious, or between nervous-bilious and sanguine-lymphatic,—is likely to yield the most happiness to the persons themselves, and to avert transmissible tendencies or obliterate them altogether.

Wedlock should not be entered into at all, when one of the parties, either in person or in the family history, has a noted tendency to a transmissible *constitutional* disease, most especially if that disease is one that has a degenerative tendency,—as consumption, epilepsy, insanity, cancer, or gout. Milder troubles may be overcome, but these are of so permanent a character that their power for evil is very liable to be manifested in a disastrous form in the children. It is only when the tendency is so nearly eradicated as to be quite trifling in the one parent, and the other parent is a suitable contrast in temperament, and the hygienic surroundings are of the best class, that immunity from propagating the disease is probable.

When both parents have the same taint in their persons or their families, escape is virtually impossible, as to constitutional maladies; and maladies of a local class, or moderate mental peculiarities, are likely to be intensified in the children. Any adverse surroundings—as close quarters, poor food, overwork, anxiety, severe sickness, too frequent pregnancies in the mother, and other influences that reduce the vital tone—hasten and aggravate the development of transmissible disease, in all cases.

It is under this important law that blood relations should not marry. Descending from one common stock in part, they are more than probably impressed in constitution with the taints incident to that stock, and especially may beget children lacking in constitutional vigor and inclined to physical deformities. Such will be the common facts when first cousins marry; and the same

may be extended even to cousins of the third degree, when these bear decided resemblances to each other in mental or physical peculiarities. Of course it is a question dependent in part upon the constitutional resemblances between the relatives, thus carrying down the disease-taints of the family. Where there is a contrast even in first cousins, showing the good effects of their related parents marrying into families decidedly contrasting with their own, the dangers to their children would not be so great as if these cousins resembled each other, probably not so great as in a marriage between unrelated persons with a distinct constitutional malady descending on one side. Yet even then, the fact that hereditary influences may be lessened in one generation, only to spring forward with greater force under favoring circumstances in the next, usually prevails by and through such inter-marriages. Although the cousins may themselves be in good health, and neither of them show signs of the consumption or epilepsy or mental eccentricity that existed in the grand-parent or other ancestor; their marriage is a circumstance that very distinctly tends to rekindle that remote family inclination, and to focus it with sad force upon the children.

So exceedingly numerous and common are the facts, that evil effects upon the offspring of first cousins constitute the rule, and immunity from constitutional disease or personal deformity is the exception, where any taint previously existed in the family stock. Statistics bearing on the question are extensive, sometimes warped for the sake of bad argument. Dr. Bemiss, of Louisville, about twenty years ago gave the most carefully compiled tables yet furnished, and probably the most accurate and just that are to be found. This report gave 580 instances, obtained through reliable medical men from all sections and representing all classes of society, where cousins intermarried. To these were born 2,778 children. Of these children, 637 died early, 793 were defective, 53 deformed, 117 deaf and dumb, 63 blind, 44 epileptic, 231 idiotic, 24 insane, 189 scrofulous. This is a *very much larger* proportion of defects and sad impairments than would be found in the same number of families under even extraordinarily poor circumstances.

Law has made marriage between first cousins an offense in some States, and should make it so in them all; and so should intermarriages of other classes,—as between uncle and neice, aunt and nephew,—be made an offense against society and the State.

CHAPTER XV.

AGE AND ITS INFLUENCES.

THE different periods of life have certain general tendencies and dangers, and should receive special guidance. Various divisions of these periods have been made, the following seeming to be a good one:

1. *Intra-uterine life.*
2. *Infancy*, from birth to completion of first teeth.
3. *Childhood*, from dentition to 7th year.
4. *Adolescence*, the period between 7 and 14 years.
5. *Puberty*, the period between 14 and 20 years.
6. *Adult age*, the period between 20 and 30 years.
7. *Maturity*, the period between 30 and 45 years.
8. *Turning-time*, the period between 45 and 60 years.
9. *Advanced Life*, the period between 60 and 80 years.
10. *Old Age*, the period between 80 and 100 years.

Of course this division, in its later sections, is arbitrary. It scarcely accords with the common sentiments of the present day, where youths of 16 are accustomed to estimate themselves as full-fledged men and women, and to consider well-matured people of 50 years as being dilapidated "old folks." But it is a division that most nearly preserves the unities of fact and speech, and is based upon the normal Lease of Life (Chap. II). Some thoughts on each period may be offered.

I. *Intra-uterine Period*.—The health, habits, mental course, and general conduct of the mother during the development of the unborn babe, have a material influence upon the child. Her blood supplies its blood, her robustness or feebleness impresses the child, her mental calmness or excitability touches her offspring. The father's constitutional impress is very great, that of the mother is yet greater; hence the need that mothers should be firm and healthy in body, should avoid all excitements and occasions of exhaustion during pregnancy, should not be imposed upon by the husband, should have sufficient daily exercise to maintain firm muscles and good digestion, should be very regular in habits and make no abrupt changes in any of them, and should dress in a suitable manner. Further details belong to my Woman's Book of Health.

II. *Infancy*.—During this period all the tissues are lax, the

amount of blood is relatively greater than at any other period, and the vital functions are all carried on rapidly. Respiration is from 25 to 30 per minute; pulsation 115 to 120; perspiration is easily increased; and the amount of food required by the rapid-growing frame is from three to five times greater, in proportion to the weight of the body, than is required by adults.

The chief outward dangers of infantile life are from cold, on account of exposures and improper clothing. Over-feeding and irregular feeding are its dangers from within,—irregularity in nursing and in feeding-hours being a severe disadvantage to a babe. The mother's milk is the only proper food until about the ninth month, or until the incisor teeth have been cut; and solid or prepared foods previous to that time are not at all proper except under positive necessity. Change of food should be made gradually and cautiously, introducing a very little cow's milk with bread once a day; and after a few weeks carefully increasing the quantity as the stomach gets stronger. In this way a child gradually undergoes a weaning process from the ninth to the twelfth month,—at or near which time it is best for mother and child that the child be no longer nursed. But milk is Nature's grand and principal article of diet until about the end of the second year, furnishing the elements of infantile nourishment in desirable admixture and in a form for the easiest digestion.

Dentition usually begins with the two lower stomach teeth between the fifth and seventh months; then the two upper stomach teeth, and a lateral incisor on each side of these, between the eighth and tenth months. A pause of six to ten weeks now follows, and then (from the twelfth to the fifteenth month) six more teeth appear,—two molars or "grinding" teeth above; then two lateral incisors and next two molars below. Another rest, and from the eighteenth to the twenty-fourth month two lower canines and then two upper canines appear, almost without disturbance. After an interval of about six months, or during the last half of the child's third year, the last molars of first dentition are brought out,—two in the lower jaw, and then two in the upper.

This entire period of dentition, except when the four canines are cut, is one of sensitiveness of the bowels, inclining the child to diarrhoea, faulty intestinal digestion and feverish restlessness. When the last molars are being developed, there is an added

liability to convulsions and to croup. During this entire time, the diet should continue light and simple, potatoes and oatmeal being among the solid foods, egg as animal food, and remarkably small allowances of lean beef or other meat. The practice of giving these children fat meats, gravies, etc., is certainly ill-advised; and although many children live through this regimen, very many die because of it. When dentition is too premature, it marks a danger of overly-large head, tubercular disease, or serious convulsions; and when much delayed beyond the usual time, it is evidence of deficient strength more or less inclining to rickets. In either case, there is need of extreme watchfulness in diet and clothing, in provision for daily out-door life, and in restraints upon mental and nervous excitability. Throughout infancy, a large amount of sleep should be promoted; and until a child has passed its third year, it should get at least one good nap during the day, and two are better.

III. *Childhood*.—In this period, the pulse gradually falls to 100 or 90; respirations 23 or 22. All structures remain soft and loose; and the glands of the neck and groin (lymphatic glands) are liable to enlarge and to form gatherings if the previous or present diet is too gross for the child's years. Spinal and brain tissues grow rapidly and are sensitive. The frame is now susceptible to catarrhs, diarrhoea, sore throat, eczema and other irritable skin diseases, meningitis, to contagions, and to delirium or convulsions when ill.

During this period, cow's milk should continue to be used freely, while bread, potatoes and lean meats are introduced in gradually increased proportions. If the child have a good appetite, it will need a liberal supply of food to satisfy the demand of the growing frame; and hence it is more common to under-feed than over-feed during these years; but *regularity* must be observed in eating, even if the child have food five times a day or eat later than usual in the evening. Butter, cream, and some fatty gravies are now required; cooked fruits and vegetables are to be brought into the dietary, and regularity in evacuating the bowels is to be taught. Parents are often unwisely anxious to send their children to school early and force them into precocious learning; but weakness of the nervous system too often follows premature taxing of the now active mind. Far better to delay schooling, and provide every suitable facility for an outdoor and romping life,—which may *seem* to waste time that should be given to education, but is

invaluable as a beginning to that solidified frame which in after years will make education valuable.

IV. Adolescence.—This is the period of the second dentition, the first teeth being loosened and thrust out, the permanent and larger teeth taking their places. The change is made gradually and with no especial disturbances. But the tissues now start upon their first stages of rapid solidification; their softness and plumpness lessen, and they become firmer and more distinct in muscular outlines. The bones also increase in length and solidity; and the spinal cord, brain, and general nervous system develop rapidly.

During this series of marked changes, and especially in the first years and before they are completed, the frame is liable to many nervous disturbances because of its over-sensitiveness. From the seventh to the tenth years, especially, there is liability to St. Vitus's dance and even to the beginnings of epilepsy. Rheumatism may appear during that period; and the developing mind is strongly emotional, likely to become very capricious from deficient powers of self-control, and needs the wisest combination of calmness and firmness to guide rather than to force it into a healthy steadiness.

Appetite usually changes now, meats and fats being often less desired and fruits demanded. This claim of Nature should be heeded, and fruits and vegetables in varied forms allowed freely, with a full share of lean meats as required. A keen appetite is the rule, the system needing large amounts of food to sustain its growth. If the appetite and digestion fail, and the weight diminishes, they should be considered as evidences that the brain is overworked at study or by excitement, or that the hours of sleep are too few, or that the play is either deficient or excessive, or all these or other influences are busy in disturbing the laws of health.

Hearty foods may be used nearer bed-time than usual, and not unfrequently four substantial meals a day should be provided, with warm milk or cocoa as a drink when agreeable, and soups of enriching quality every day. Clothing should be arranged to protect the skin against sudden changes of temperature, merino next the surface being most desirable. Study should be moderate, much more so than our Nation is at present disposed to believe; and out-door life should be encouraged. Most children are fond enough of play; but some incline to withdraw from other boys

and girls, and to remain in-doors with books or fancy-work, while others would play till quite worn out. Extremes should be guarded against, in both these directions. Retiring and sedentary natures should be induced to practice more hilarity and romping, limiting the amount to their strength and arranging for a goodly period of rest at a stated time each day. One to two hours of quietude on a lounge each morning and afternoon, or some other mode of complete rest and quietude, is an admirable course with pale and delicate children; and a bath three times a week, forenoon or evening, with tepid water containing one or two table-spoonsful of Ditman's sea salt, following the bath with good friction, is a fine toning method. A few weeks at the sea-side is admirable hygiene. When a child is restless in its sleep, it may be because of too violent play or exercise rather than from over-eating; and then their exertions should be moderate, and a period of rest each morning and evening provided.

Children require plenty of sleep, nine or ten hours being really necessary during this period; and it is advisable to allow them to lie abed pretty late in the morning,—not waking them out of sleep except in a gentle and casual manner when they have had a full quantity, but insisting on leaving the bed in a very few minutes when they awaken. Friedlander gives the following table for dividing the time during this period:

AGE.	HOURS FOR			
	PLAY.	WORK.	REST.	SLEEP.
7	8	2	4	9 or 10
8	8	2	4	9 or 10
9	8	3	4	9
10	8	4	4	8
11	7	5	4	8
12	6	6	4	8
13	5	7	4	8
14	5	8	4	7
15	4	9	4	7

Such a table is suggestive, but should not be adhered to with unbending rigidity; for children of different constitutions and temperaments differ in their requirements. German children, for whom this schedule was made, can usually do more work (or study) at 14 and 15 years, and can do with less sleep, than the majority of nervous American children. The four hours allotted to rest or quietude, are probably none too many; and it would be well

if American children were led to cultivate that much ease-taking, and thereby promote the lymphatic temperament and accumulate a reserve of vitality.

Study must be regulated as a matter *secondary* to the development of the body,—a point that cannot be too strongly insisted upon. A child growing rapidly and undergoing the changes in the nervous system peculiar to this period, can seldom follow in safety the course of study ordered in most of our public schools. In cities, this course is heavier than in country districts, although cities furnish fewer opportunities for the child to maintain suitable bodily vigor. If Educational Boards have not yet got education enough themselves to adjust a sensible course of study according to the years of the child, but must exhibit their own folly by turning our public schools into places for breaking down the strength of the Nation's children by over-straining the brain and nervous system; then parents should use their own common sense for the protection of their offspring, and firmly moderate their amount of study and reading. Excessive reading of unnatural and vicious stories, or even of pure but sensational stories, does much toward giving a warp to the emotional nature.

V. *Puberty*.—A lull in the growth of the body takes place usually in the thirteenth year, and continues till the advance of puberty. At this time the genital organs of both males and females begin to grow and to prepare for their especial offices. With this growth, the body also springs into final proportions and prepares for the procreative powers. The boys and girls suddenly shoot upward in height to their full stature of men and women. The chest is narrow and flat during this growth; the digestive organs have trouble in supplying the demands of the body for nutrition; the nervous system is highly sensitive and excitable; the heart is taxed to maintain a full circulation to the entire body, and may retard the general growth by its partial failure.

Steady out-door exertion is a first necessity in this period; for the body must be made firm now, or it is not likely to become so. Games on the lawn, and suitable gymnastics, must be enjoyed regularly; and girls should have their full share of such invigorating pastimes. Over-strain of the heart must be guarded against; for it may be caused by too violent exertion in running, rowing, gymnastics, and other healthful and desirable sports. The chief dangers of the period are to the nervous system from over-study or irrational modes of life; and to the lungs in not securing them

a growth proportionate to the other parts of the body. Good or bad habits for life, and a good or bad constitution, are commonly formed in this period; which should, therefore, be guarded and guided by every rule of hygiene.

Periods VI and VII require no especial mention here, being the years of life when men and women are at their best physical estate. Period VIII covers the years when the bodily powers pass the acme of vigor and begin to decline. Mentally, the intellect is ripest during this period, the anterior portion of the brain often increasing slightly to about the sixtieth year. But gradually the density of the tissues becomes greater, the hair turns gray, the sight changes and hearing gets more dull. Often the heart-walls thicken, and men are prone to diseases of the blood-vessels and women to palpitation. When women have passed their catamenial change, they may grow fleshy; and sometimes exhibit the mental caprices, wakefulness, hysteria, and other female peculiarities incident to the first years of puberty.

Dr. Waterhouse, in 1807 (Sinclair's Code of Health), made the following observations:—In every human life there are three important periods, which may be termed sickly or moulted times. The *first* is in females about their thirty-third year, and in males about the thirty-sixth; when the lean become fatter, and the fat become leaner. The *second* is between forty-three and fifty, and usually occupies about two years. In this the appetite fails, the complexion fades, the muscles get more flabby, sleep is less refreshing than before, the spirits droop, a lack of sprightliness creeps over the frame, and changes of weather are felt quickly. Between sixty and sixty-two, the *third* of these periods occurs, the same in quality as the second but much more pronounced.

During this "turning period," the diet should return to a large excess of farinas, vegetables and fruits, with a decided limitation of meats. Acids at moderate intervals are beneficial; and riding and walking are exceedingly important as exercises to the fleshy, though violent muscular exertions must be avoided. Lean persons should wear extra-warm clothing, and during the cool months protect the abdomen well with flannel. Hot baths are well borne, once a week; to be followed always with a brief cold douche or plunge, and then extra brisk friction. Emotional excitements are to be guarded against.

IX and X.—Advanced Life and Old Age are liable to come earlier than the years named, the changes belonging to them not being respectful to dates. The decline of life steadily loses the softness and pliancy of the tissues. The muscles waste, the fat lessens, nutrition is less active, the blood becomes poorer because of poorer digestion and assimilation. The circulation falls, the pulse declining to 68 or 65 beats per minute; and thus the extremities get cold easily, and the general surface warmth is quickly reduced by changes of the temperature. Dryness of the skin favors itchiness, eczema, and other surface irritations; and also throws an extra labor upon the kidneys and lungs, developing bronchial catarrhs and various kidney troubles. Urine is passed slowly, and more frequently than heretofore. The arteries become hardened and liable to chalky deposits; and from their brittleness comes the tendency to break which causes so many apoplexies and brain softenings and gangrenes in elderly people. Cancers and other degenerate forms of disease are most common after 50. Fever and inflammation are not so usual in these riper years; and a slight febrile excitement is much more serious than in earlier life.

Warmth is a first and constant necessity with old people; and the natural heat of the body must be preserved by every careful device in clothing, exclusion of drafts, heating the house night and day, etc. It is now that the proper observance of hygiene in early and middle life begins to show its value, and recklessness to exhibit its consequences. The foods should be easy of digestion, meats boiled and then baked to increase their digestibility, stews and concentrated broths used freely, farinas lessened in amount. A hot foot-bath frequently, and a *brief* hot bath once a week, are usually advisable. Considerable sleep should be taken, and a goodly nap indulged before dinner and toward evening. Constipation must be guarded against, and the bowels moved not later than every second day by some mild physic other than salines or purgative waters,—which are too cooling for the blood now.

CHAPTER XVI.

THE INFLUENCE OF OCCUPATION.

THE influence of one's occupation upon his health and his expectancy of life (p. 19) is very considerable. Occupation includes the surroundings connected with the employment, and the mental condition of those engaged in it, as well as the immediate influence of the calling itself and the strain or taxation to which it subjects different organs. A pursuit that would employ all the muscles alike, and give the mind sufficient exertion to maintain its vigor, and secure a large share of out-door life without severe exposures, would be an ideal in its influence on health. But such pursuits are the least common of all the businesses in which men engage, the majority of callings demanding exposures to weather or other influences that are more or less taxing to the health.

In classifying the varied injurious surroundings of occupation, the following may be accepted: I.—Exposure to the inhalation of irritating, poisonous and offensive gases and vapors,—as workers in metals, chemicals, colors, scourers, soap-makers, etc. II.—Exposures to poisonous or irritating dust,—as stone-cutters, grinders, potters, millers, lithographers, brush-makers, flower-makers, hatters, paint-grinders, etc. III.—Exposure to variable weather and temperature,—as boatmen, drivers, masons, cooks, firemen, dyers, forgemen, etc. IV.—Undue use or over-exertion of certain organs,—as of the eyes among engravers, watchmakers and lacemakers; of the vocal organs among singers and public speakers; of the nervous system by merchants, brokers, physicians and tea-tasters. V.—Constrained attitudes,—as with shoemakers, tailors, seamstresses, compositors. VI.—A too sedentary life,—as with clerks, artists, teachers, literary men.

It is difficult to ascertain the mortality or death-rate due to an especial occupation; for it may be increased or lowered according to the age and constitution of those entering it, and by their neglect or observance of the laws of general and personal hygiene. The climate and location in which men reside, naturally add their influence for or against the occupation,—enlarging or moderating its death-rate. Nevertheless a reasonable estimate upon the healthfulness of a calling can be made after a due consideration of its character, and of the statistics

thus far gathered. One of the carefully prepared tables is by Dr. Jarvis, giving the average longevity of some leading occupations in New York, Massachusetts and Rhode Island, as follows:

<i>Occupation.</i>	<i>Average Longevity.</i>	<i>Occupation.</i>	<i>Average Longevity.</i>
Coopers, - - -	Years, 57.04.	Tanners, - - -	Years, 47.90.
Clergymen, - - -	" 55.36.	Merchants, - - -	" 47.55.
Physicians, - - -	" 54.32.	Clerks, - - - -	" 47.46.
Lawyers, - - - -	" 54.26.	Cabinet Makers, -	" 46.24.
Blacksmiths, - - -	" 51.51.	Painters, - - - -	" 43.37.
Carpenters, - - -	" 49.72.	Shoemakers, - - -	" 43.03.
Masons, - - - -	" 48.29.	Tailors, - - - -	" 41.08.

Extensive and authoritative reports have been compiled for the State of Massachusetts, extending over a period of twenty-three years. Dr. Beard has divided these into ten general classes, giving the following average longevity:

1. Managers of estates and educated farmers, - Years, 64.40.
2. Clergymen, lawyers, physicians and professors, " 56.48.
3. Active mechanics working abroad, - - - - " 51.04.
4. Musicians, editors, architects, etc., - - - - " 50.35.
5. Merchants, capitalists, financiers, - - - - " 48.26.
6. Active mechanics in shops, - - - - - " 47.93.
7. General laborers, - - - - - " 46.49.
8. Employed on the ocean, - - - - - " 45.38.
9. Inactive mechanics (engravers, watchmakers, shoemakers, etc.,) in shops, - - - - " 42.89.
10. Laborers abroad,—such as butchers, drovers, teamsters, - - - - - " 34.71.

"These statistics are exceedingly suggestive. Observe that of these ten classes the first five may properly be regarded as brain-workers, while the last five include those who depend chiefly on their muscles. Observe that laborers with no special trades, and consequently with no special responsibility, come four years short of the average longevity [which is a little over 50 years for the ten classes]; while cultivators of the earth, who own and control farms, exceed it by fourteen years. Observe also that clergymen, lawyers, and physicians exceed the average longevity by six years,—having a greater expectation of life than any of the ten classes except cultivators of the earth."

From all the statistics now gathered, it would seem that

these of Massachusetts hold a very close ratio to those of other States and of England; and it is not necessary to multiply such tables.

As already stated, the different circumstances under which any calling is pursued have a large bearing upon the death-rate of those engaged in it. Thus in the case of children being engaged in mills and other in-door work, their tender frames cannot endure the taxation of bad air, dust, and other surroundings; and they go down and die in such large numbers, that some years ago British humanity became appalled at the losses, and protected children by legally forbidding their employment in factories when under specified ages. Physicians in the country better endure the exposures when young and succumb to them in advancing life; while young city physicians have such a prolonged struggle to obtain a business foot-hold as to suffer greatly from the "worry that kills"; and elderly city physicians usually have obtained a business support and have a better expectancy of life in consequence.

Brain-work is promotive of health and long life, when followed under favorable circumstances. An enormous amount of intellectual toil is possible, when men are obedient to the laws of health, obtain abundant exercise, and are free from mental anxieties concerning daily bread. In testimony of this, the advanced age of some men of letters is often quoted. Eminent among these are the following: Halley 86, Newton 85, Franklin 84, Herschel 84, Buffon 81, Harvey 81, Young 80, Wieland 80, Galen 79, Galileo 78, Roger Bacon 78, Francis Bacon 78, Corneille 78, Jenner 75, Locke 73, Haller 70, Petrarch 70. These were men of a grand constitution (p. 12) to begin with; and their mental pursuits were of a mild character, not throwing heavy taxations upon the brain, associated with a remarkably plain diet and much out-door recreation, and free from prolonged anxieties. Under such circumstances, there can be no doubt of the healthful and life-prolonging character of mental pursuits. Witness the high average longevity of clergymen and professors.

But most emphatically is it true right here that "it is not *work*, but *worry*, that kills." If intellectual pursuits are followed under stress of anxiety for daily bread, pressed at the highest speed from competition or from sheer need of money to live upon, occupying too many hours with almost no oppor-

tunities for muscular exercise and recreation, the effect upon longevity is disastrous. Thus the calm and well-paid jurist, though occupied many long hours every day in a close court-room, has an average longevity of over 66 years; while the worried and ill-paid teachers scarcely average 40 years, and news-paper reporters average only about 35. The heavy strain upon the nervous system makes itself felt in dyspepsia, and often in mental disturbances after middle life; and it is a constant fact in the history of disease that an over-strained and exhausted nervous system is rallied from and restored to its original tone very slowly indeed.

An occupation is usually determined by the influence or the force of one's situation, a certain kind of business or work often being pursued by a family. Sometimes a pursuit is a matter of choice, or of strong inclination,—one having a peculiar bent of mind toward a certain calling, or an especial adaptability to a particular kind of work. In any case, it is well to know the lines of danger incident to an occupation, so that these may be avoided as far as possible. And one should endeavor to escape a trade or calling that is especially objectionable, or for which he is not by constitution fitted. A slender and delicate young man needs out-door life with muscular exertion to a considerable extent; but it would be folly for him to become a mason or a quarryman, for he would succumb to the severe toil and exposures incident to such trades. A man of muscular frame and great brawn would be quite ill at ease in attempting the fine work of a jeweler or an engraver.

The line of danger in any particular occupation being known, every means should be taken to protect the frame against that danger. Workmen are proverbially careless of themselves in the very things where the greatest care is required, becoming familiar with the danger and then reckless concerning it. No prudent man will pursue this course, but will exercise every judicious precaution in behalf of his own life. Health may be protected by such prudence, and maintained in pursuits that are in themselves exceedingly trying.

The sanitary surroundings of working people are often sadly neglected. In factories they are not always provided with sufficient light and ventilation, and are frequently crowded in too great numbers in rooms with low ceilings, too few windows,

and filled with dust or fumes. The consequences of such surroundings have been disastrous. Fortunately a marked change is taking place in these matters as the laws of sanitation come to be better understood. Factories are larger, lighter, and higher in the ceilings, than formerly, and workmen have more space allowed them, with better provisions for heating and ventilating. The results are markedly in favor of the workers. America has made great advances over the crowded and dingy workshops of Europe, and the health of American workmen is correspondingly better. If manufacturers take pride in rearing large structures, those who labor for them enjoy a peculiar share therein by the better health they enjoy and the fewer losses they suffer on account of sickness.

In an article upon this subject, Dr. J. M. Fothergill makes the following remarks: "In monotonous occupations, entailing no demands upon the intellectual powers, there is a great tendency to mental disease. No fact is better established than this, and the proportion of insanity among agricultural laborers is much higher than it is amidst the members of energetic professions and occupations. Disuse of an organ is almost more fatal to its activity than its excessive use. Certain it is that a fearful price is paid for those divisions of labor which, while commercially successful, entail a terrible tendency to insanity in those engaged in such monotonous occupations. The sense of ennui and of depression entailed by such wearisome labors, incites the men, when work is over, to plunge into dissipation and alcoholic excitement. In female operatives so engaged, recreation of even a more questionable character is common, and much of their immorality is strictly due to their uninteresting and monotonous pursuits. Amidst the young of both sexes, wild and unreal fiction is eagerly devoured as the natural reaction after their routine labor, and the greater the contrast between the lives of their ideal characters and their own existence, the more palatable the fiction."

It is certain that those are the most healthful occupations which secure the most equable activity of both body and brain. If a pursuit give undue prominence to the exertions of one, it should be balanced by judicious provision for the exercise of the other. Those engaged in mental and sedentary pursuits, imperatively require muscular recreation to preserve the harmony of their organization, as will be pointed out in

the chapter on exercise. Those engaged in muscular labors need to give a portion of time to real mental work, otherwise the mind dwarfs and the man is reduced to a lower plane. It is on this account that so many working-men, disinclined to use their limited spare hours in study of their own calling or of some other subject, fail to rise in the scale of intellectual force. Farmers too frequently pursue the same plan, and so become dull plodders where they might be more effective thinkers by giving a brief portion of their time to study. Nature demands this employment of all the parts of the body, the diversion of a proper amount of vital activity to either one giving a desirable rest to the other, and the equable use of both securing that due balance in development which makes the perfect man (p. 102). Dr. J. P. Irvine presents an epitome of the facts in the following language.

"Too much work and too little work—mental or bodily—predisposes to disease. Continued over-work reduces the system generally, and special organs in particular, according to its nature. A coachman, who uses for many hours certain muscles in driving, suffers chiefly in them when he has an attack of muscular rheumatism. So also those who use the brain too much in intellectual work, are predisposed to derangements of the nervous centres. Physical over-work is often conjoined with exposure, and with improper or irregular food supply, and the combination has a marked effect. It has so predisposed armies to disease, that their ranks have been decimated by fevers, pneumonia, and bronchitis, far more than by the cannon or by the sword. Not a few medical men have been affected by the contagia of the acute specific diseases (p. 72), because when exposed to them they were worn out by bodily and mental exertion, and by protracted fasting. Over-work reduces the nervous power, and thereby strikes at the very root of the healthy status. On the other hand, a sluggish use of the mind or body is favorable to disease; and some persons are so constituted that they cease to be safe when their minds have lost the opportunity of active exercise,—and the very fact that they substitute an abnormal intellectual employment, is proof of this truth. And what is true of the mind is true of the body. A sudden change from active bodily exercise to bodily laziness, predisposes largely to disease."

We find illustrations of this latter proposition in men who

retire from active pursuits before their mental or physical powers begin to wane by the advances of age. The acquisition of a competence, or some other motive, leads them to withdraw from business. Suddenly putting off their habitual activity, they become morbid in feeling and disturbed in their functions; and it is not at all uncommon to see such men suddenly die after a brief enjoyment of the idleness that followed their cessation from accustomed effort. It is far better to continue one's occupation, and to be busy to the very last,—only diminishing its intensity by slow degrees as the lessening vigor of age tells that what before was an easy load has become a burden and a strain.

CHAPTER XVII.

DIGESTION, DIET AND DRINK.

DIGESTION is a complex process,—carried on by the Vital Force for the purpose of preparing food into substances out of which living tissues can be made. It begins with mastication of the food, mixing it with saliva that is secreted by three pairs of glands in the mouth; which process of minutely grinding and completely mixing the substances should be performed slowly and thoroughly. Next the masticated food is acted on by the gastric juice secreted in the stomach,—being moved and rolled about by the muscles of the stomach for the purpose of bringing this juice into contact with every particle of the food. Leaving the stomach, it meets in the duodenum the bile and a secretion from the pancreas (sweet-breads); and the digestive process is completed during the slow and undulating movements the aliment undergoes as it is mixed with these and other secretions while passing down the intestines.

Each of these three processes should be conducted healthfully, in order to make digestion perfect. Failure in mastication will leave it unmixed with saliva; and will also pass it into the stomach in a condition not well suited for this organ to act upon. Haste in swallowing, frequently causes stomach indigestion; and persons with decayed or lost teeth often fall into severe and prolonged dyspepsia, which cannot be remedied

effectually till old teeth have been removed and replaced by artificial ones,—thus again making good mastication possible.

In the stomach, the gastric juice is of a sour (acid) character, and contains also the digestive substance known as *pepsin*. This juice is secreted by large numbers of minute glands in this organ, being formed during the presence of food there, and adults probably secreting from two and a half to four ounces, or even more, at each meal. If food is not supplied at the usual meal-times, the sense of hunger and the habits of the person will cause a limited flow of gastric juice; and hence the peculiar feelings one has in the stomach when the customary hour for eating passes without his taking food. When the amount or quality of food eaten is beyond the natural power of one's stomach to digest, weariness and weakness of this organ follow, making the most diverse and distressing forms of dyspepsia. Ill-digested portions of the food then also pass into the bowels, often irritating these and causing colic or diarrhoea, and making a tax upon the liver which usually wearies this organ, and causes it to become diseased. Although it is common to look upon digestion as essentially belonging to the stomach, this opinion is a mistake; for not only does a large share of the process belong to the intestines, but intestinal digestion is equally of vital importance with that performed by the stomach.

Foods are classed in three groups, according to certain characters they possess. I. *Nitrogenous*; including albumen of eggs and of vegetables, milk, lean meats, cheese, fish, and such leguminous substances as peas, beans, lentils, etc. II. *Oleaginous*; which includes butter, suet, and all forms of oils and fats in both animal and vegetable foods. III. *Farinaceous*; in which class are included farinas, starches and sugars, as found in large quantities in potatoes, wheat, corn, oats, sago, and the majority of grains and vegetables in general use. Besides these are various salts, or saline substances, existing chiefly in vegetables and fruits, but also largely in animal foods,—such as phosphorus, lime, soda, potassa, and iron compounds. And a large percentage of water enters in the composition of the several foods as a necessary solvent. Most foods contain two, and often three, of these classes of substances,—meats having the lean (nitrogenous), the fatty and the saline elements in varying proportions, with about 75 per cent. of water; wheat con-

taining farina, with small portions of albumen and salts, and about 15 per cent. of water. No article of diet, except the isolated "whites" of eggs, can be said to at all represent but one quality of aliment in this classification; and even this food is not albumen alone.

The extent to which Nature has mingled these classes of elements in different foods, is seen in the following tables:

Amount of Sugar in 100 Pounds of

Rice - - - - -	lbs. 0.4	Wheat Flour - - - - -	lbs. 4.2
Indian Meal - - - - -	0.4	Barley Meal - - - - -	4.9
Peas - - - - -	2.0	New Milk - - - - -	5.2
Turnips - - - - -	2.1	Oatmeal - - - - -	5.4
Cream - - - - -	2.8	Parsnips - - - - -	5.8
Potatoes - - - - -	3.2	Buttermilk - - - - -	6.4
Bread - - - - -	3.6	Treacle - - - - -	77.0
Rye Meal - - - - -	3.7	Brown Sugar - - - - -	95.0

Amount of Fat in 100 Pounds of.

Potatoes, Carrots - -	lbs. 0.2	Corn meal - - - - -	lbs. 8.1
Parsnips - - - - -	0.5	Egg - - - - -	10.5
Buttermilk & Rice - -	0.7	Eels - - - - -	13.8
Bread - - - - -	1.6	Veal - - - - -	15.8
Skim milk - - - - -	1.8	Tripe - - - - -	16.4
Wheat & Rye flour -	2.0	Cream - - - - -	26.7
Peas - - - - -	2.1	Fat Beef - - - - -	29.8
Barley meal - - -	2.4	Egg Yolk - - - - -	30.7
White Fish - - -	2.9	Cheese - - - - -	31.1
Lean Beef - - - -	3.6	Fat Mutton - - - - -	31.1
Liver - - - - -	4.1	Fat Pork - - - - -	48.9
Lean Mutton - - -	4.9	Bacon - - - - -	66.8
Salmon - - - - -	5.5	Dried Bacon - - - - -	73.3
Oatmeal - - - - -	5.6	Butter - - - - -	83.0
Skim Cheese - - -	6.3	Drippings - - - - -	83.0

In the process of digestion, the stomach acts chiefly upon the nitrogenous or albuminous class of the foods, and when these are prepared suitably by the gastric juice, the products of this part of digestion are largely absorbed into the blood-vessels of the stomach. In the duodenum and the upper bowels, the fats are acted upon by the bile and the pancreatic juice; and the farinas and starches are acted upon by these secretions and by the secretions from the glands of the bowels.

Upon completion of the intestinal digestion, the waste elements are cast out and the nutrient elements are taken up and passed through a mesh-work of small glands (mesenteries), where they begin to be changed into vitalized compounds, and then move on into a duct which runs upward near the spine and empties into the jugular vein on the left side, and then to the heart.

Stomach digestion occupies from two to three or more hours, according to the food eaten and the healthy state of the person; the secretion of the gastric juice being mostly completed in an hour and a half. Then the stomach requires a period of rest before being again excited to labor by the presence of food. Intestinal digestion proceeds more slowly, the food moving backward and forward in its downward progress and usually occupying eight to twelve hours in its descent through the average length of twenty-five feet of bowel. When hurried through in much less time, this part of the digestive process is not likely to be perfect.

Experience has shown that man requires the three classes of food-elements, and cannot prosper without them. Deprived of a suitable amount of either class, his health begins to suffer and his system to be impoverished. In the several organs established for the processes of digestion, preparation has been made to utilize each class for the purposes of life; and the nutrient repair of the system can never be complete unless the different kinds are furnished. The proportion of each class required will differ with the age of the person, as also to some extent with his occupation and temperament. Young children require most farinas, but must have a moderate portion of fats and a goodly portion of nitrogens. In middle life more nitrogens are demanded, and especially so among hard-workers and those of biliary temperament,—sedentary and nervous people requiring less meats. The apparent ratio of the three food-classes required in adult life is: Farina and starch (sugar) group, 3. Albuminous or nitrogenous (lean-meat) group, 1. Fats, 0.6.

Curiously enough, these proportions as decided by science are practically the same as man's instincts always strive to maintain. When a particular article of food is lacking in one of the classes of constituents, the deficiency is made up by associating it with some other article that has an excess of that constituent. Thus, veal, fowl and liver are quite limited in fat, and they are associated with bacon or lard in cooking. Some

kinds of fish are dry, and we fry them with butter or oil; others possess fat enough in themselves. Cabbage, which is almost void of fat and albumen, is boiled with fat pork, or made into a slaw trimmed with eggs, or into a salad with eggs and butter (or cream). Beans are in the same list, and are eaten with fats. Sago, rice, tapioca, potatoes, and other nearly pure farinas, are eaten with milk, or with sauces containing butter and eggs, or a fat gravy. Bread, a typical farina, we eat with butter or milk. In numerous ways the mere instincts of man have guided him, through the palate, to the very combinations that will reasonably supply his wants in the three classes of food elements.

Variety in foods, therefore, should be sought for the welfare of the whole system, and for the preservation of an even digestion. It is not necessary to have an extensive bill of fare at each and every meal; for that is likely to pall upon the taste or tempt the appetite to over-indulgence, from which disturbances of digestion will gradually be developed. A *moderate* variety, embracing the three classes of food, is best at a single meal; and then the meals themselves should be varied, and this variation should extend to the days so as to avoid too close a resemblance between the meats and farinas and fats in the meals of one day and those of the next. Farther change should be made by adopting different styles of cookery, it being a simple matter to prepare any article of food in a number of diverse ways. A little thought and ingenuity in these matters will enable a housekeeper to present the household with a wide range of dishes during the week, and all of them palatable and cooked healthfully. The effect on the family will be excellent; indeed a proper course in this would almost put an end to our National malady—*dyspepsia*.

In America there is too much disposition to run to extremes in this as in other matters. Wealthy people use too many dishes, and cultivate a too “fatty” style of cookery; and they find their penalty in deranged livers and weak stomachs. Farmers and other hard-working people go to the opposite extreme, living too continuously on the one round of salted meats, fat gravy, bread, potatoes, and pie. Their diet is, as a rule, too much fat and too much salt; without sufficient amounts of fresh lean meats, fresh fish, and variety in vegetables. And in the matter of cookery, there is generally

too much sameness—changes being sought more in a long list of nearly indigestible preserves, and sweet pickles, and fatty cakes, rather than in diversity of culinary processes. Such persistent uniformity is not conducive to health; nor is it so economical as would be a suitable change in the foods themselves, and then a large variety in the cookery. Most European nations are quite in advance of us on these matters. We enjoy an overwhelming abundance of all foods, but adopt a system of frying so much of it as to impair its healthfulness; while the less favored English do more boiling in their cookery, and gain largely thereby. The French surpass all others in getting up a large variety of dishes out of a few articles, making them all relishable at very small cost. Americans have scarcely begun to learn the art of maintaining a varied and healthful table by using a limited bill of fare that is changed easily, and yet with a tasteful congruity, every day.

As above noted, the farinaceous foods (always vegetable) require to be about three times the quantity of the meats or animal foods. The frame delights in using a large share of articles that are more bulky than concentrated, and that present to the system a large percentage of water. Hence it is that vegetables, which furnish a portion of starchy matter, are usually acceptable in considerable quantities; and even the coarser and more succulent vegetables are admirable among articles of diet. Greens, turnips, string beans, and similar kinds of food, while containing much water and little that appears to be nutrient, are nevertheless of great advantage to the system. So also are the fruits, whether sweet or sour; and while we can not bring these under the strict letter of the above classification, no fact in the physiology of dietetics is better proven than that the juicy fruits are a necessity to life as well as a luxury to the palate. No bill of fare can possibly be complete without them, and no day should be allowed to pass without the use of some of these articles at one or more of the meals. It is always best to make them part of the meal.

Some, but not all, of the fruits supply a form of sugar that is acceptable to the system. Of these the grape, fig, peach, blackberry, mulberry, prune and apricot may be mentioned. But very many more supply an organic or vegetable acid in some form, among which are the cherry, strawberry, sour apple, currant, gooseberry, cranberry, lemon, orange, etc.

Vegetable acids of some kind appear to be absolutely needed by the system. Chemistry is totally helpless when it attempts to dictate diet on a scheme of analysis, having at one time announced that a mixture of cheese, beans and wood ashes contained all the requisite elements of nourishment; so when chemistry can see no nutrient agencies in the vegetable acids, we can at once put aside the dictates of that branch of science and obey the well-known demands of the system. The universal craving for some form of vegetable acid, is sufficient proof of its usefulness in the economy; and that craving should be gratified to a reasonable degree. If sour fruits are not at hand, vinegar of vegetable source should be used; and the family pickle jar is a thoroughly advisable institution when not resorted to excessively. Pickles are especially suitable during the winter in the country, when there is a compulsory use of salted meats in excess.

Deprivation of vegetable acids and excess of salted meats during sea-voyages and on marches, cause that strange and exhausting malady—*scurvy*. This condition, with its diarrhoea, emaciation, and other dangerous symptoms, disappears promptly when a supply of vegetable acids is obtained. Happily the malady is now almost unknown among sailors and soldiers, steady rations of lemon-juice and onions putting an end to its destructive visits. But I have seen a corresponding trouble on land, in fine farming communities, during winters following a failure of the general apple crop, and when fruits were scarcely used and the chief family diet included a daily round of salted meats for months. As fruits and fresh meats are now more easily obtainable than formerly, this condition among farmers is scarcely ever met any more; but it once served, together with scurvy, to illustrate the need of a pretty regular supply of some vegetable acid.

In sections where a pretty hard limestone water prevails (p. 54), and in dry seasons when the wells get very low and the percentage of lime in the water increases, a curious class of dyspeptic symptoms may follow the use of such water. The gastric juice is neutralized by the lime in the water, and the person gets worse as he drinks more liberally. A feeling of acridness rises in the throat from the fermenting food in the stomach, but the use of neutralizing cordial or any other form of alkali makes the trouble still worse. Relief is obtained by

supplying the system regularly with vegetable acid in the form of lemon, or cranberry, or currants, or rhubarb, or a teaspoonful of good cider vinegar in a glass of water after one or two of the meals each day, for a time.

Salt is another article that has no direct nutrient value, so far as chemical science can show; and on that account a number of persons have entertained the idea that it is a detriment to the system and should be excluded from culinary operations. But the appetite for salt is universal, and is as dominant among cattle as among men; and although its real action in the body cannot be explained fully, though it no doubt furnishes needed elements to the formation of both bile and gastric juice, there is certainly a physiological demand for it in our dietary. Like fats, sugars, vegetable acids, and other classes of substances, an excess quite beyond the needs of the system is a detriment; but that percentage which the system readily makes use of, is an advantage.

It is impossible to establish a rule as to the amount of food the human frame requires. That is determined by what it can readily and easily digest. "It is not what we eat, but what we digest, that makes us fat." Any food taken into the system and not properly digested, is liable to become an early source of offense. Its mechanical presence may burden the stomach or the bowels; or it may ferment and cause distress by the gases produced by this fermentation; or it may even pass into a state bordering on putrefaction and become dangerous. It is not that the food is a poison; but that the undigested portions of it suffer chemical changes that turn it into substances which are not nutritive but deleterious. Good and perfect digestion is performed without any distress or inconvenience whatever; and when such inconvenience is felt in any form, it may be known that the amount of food taken has been too great or that the previous condition of the stomach was not healthy.

Size, temperament, occupation, condition of vigor and other circumstances, make decided differences as to the amount of food that an adult should receive. A sick person can digest only small quantities; and to urge much upon him, is but to augment his troubles by the indigestion and fermentation of food that will ensue. One laboring heartily must have large amounts of food, including a liberal portion of meats or other

nitrogens; while a sedentary person needs much less in bulk, and should have a large excess of farinas and fruits. A sanguine or sanguine-lymphatic temperament will digest much more than a nervous or nervous-bilious. I have for many years been blessed with a keen appetite and powerful digestion weighing nearly 200 pounds, though in earlier life a mincing dyspeptic of 125 pounds. Traveling on one occasion, our train was delayed by an accident, and we reached the restaurant station four hours behind time. Entering the dining room, I ordered a very liberal breakfast of steak, potatoes, rolls, eggs, waffles, etc. In a few minutes a fellow-traveler of rather colossal dimensions took his seat opposite me at the table, and ordered exactly the same bill of fare I had given. In a little time he called the waiter to bring him another plate of rolls, then another piece of steak, next another dish of eggs, and so on till he used the entire list on his order *twice*. Enjoying my look of surprise, he illustrated a bit of physiology by humorously remarking: "If you think a fellow of my size can get along with the same amount of food that would satisfy a little fellow like you, then you are very much mistaken!"

Climate and temperature make a difference in the amount of food required, and more in the class of foods that is most desired. In the hot summer months, more bulk of coarse vegetables and fruits is eaten, and less meats. In winter, meats are used in larger quantities, and fats are much more acceptable than in summer. These common facts are familiar in temperate climates, and exhibited even more decidedly in high southern or northern latitudes. In the tropics, there is but a limited demand for meats, the principal articles of diet being in the farinaceous and sugar classes,—as rice, sago, arrow-root, sweet-potatoes, etc., a moderate amount of fats being added to these. In the arctic regions, it would be impossible to keep alive on such foods, a large quantity of meats being demanded and the visitor soon learning to imitate the native in devouring blubber, suet, and other pure fats.

There is no manner of doubt but the majority of Americans eat more than they have any need for. This is not so true of the New England States and of large cities, as it is in more Western sections and in rural districts. Surrounded with unlimited abundance of the finest foods, obtainable at the most reasonable prices, we have become a Nation of great eaters.

Such excesses, coupled with bad styles of cookery, go far toward making the multitude of dyspeptics to be seen everywhere, and play no small part in causing many other forms of disease. A stomach continuously overworked, and a liver constantly engorged by habits of gormandizing, promote a very considerable share of the physical ailments that might be avoided by a little more restraint at the table. It seems to me probable that the majority of people in fair and good health would be quite as hearty, and feel really better, by eating one third less food than they usually do. Habitually, day by day for years, to eat a third or a fourth more food than the system really needs, puts a wearying tax upon the entire digestive apparatus.

Various tables have been made of the amounts of the different classes of foods needed per day by a man weighing 150 pounds. Of course such tables are merely approximate, and the facts of life, as to different persons, will cause them to be materially changed, yet they are quite suggestive. Prof. Dalton, of New York, shaped such a table from observations based on experiments; his conclusions being that a man in free daily exercise required as following each day: Of meats, 1 pound; of bread or other farinas, $1\frac{1}{4}$ pounds; of butter or other fats, $3\frac{1}{2}$ ounces. The amount of water varies over a wide range, according to weather, habits, etc., but $3\frac{1}{2}$ pints a day is an average. The daily ration of the U. S. soldier is: Bread or flour, 22 ounces; beef, 20 ounces (or bacon or other pork meat, 12 ounces); potatoes, three times a week, 16 ounces; rice, $1\frac{1}{2}$ ounces; coffee, $1\frac{1}{2}$ ounces; sugar, $2\frac{1}{3}$ ounces; beans, 6-10 of a gill; vinegar, 3-10 of a gill; salt, 16-100 of a gill. This is quite in excess of the allowance of other Nations, but not beyond reasonable requirements. Prof. Dalton's table is more liberal than the majority of men will digest. But these quantities would be trifling to the Esquimaux and others in the far north, where a healthy native will eat 12 to 20 pounds of meat in a day, about five pounds of which is blubber; besides consuming two pounds of bread, and eight pints of water, and then drinking the contents of the oil kettle with a relish. But as a civilized white man does not desire to bring his intelligence to a level with the Esquimaux, neither should he seek to imitate him as a gormand.

But while gross excesses at the table are prolific of disease,

and are more befitting animals than intelligent men, an insufficient amount of food is much more palpably and rapidly disastrous. Excess in some degree may be got rid of, but deficiency leaves the frame helpless. The minimum upon which one may possibly live in comparative idleness, with little muscular strength or mental vigor, is exceedingly small. Attempts are not unfrequently made by impecunious students at college, to ascertain upon how stinted an allowance of corn-meal and potatoes one may survive during a college term. It has even become a fashion for learned college presidents—themselves living on the fat of the land—to bid for students by estimating the extreme cheapness of living in their towns. One very brilliant President, who flourishes D. D. and LL. D. at the tail of his name, has been in the habit of stating in his catalogue that students in *his* town could live on 50 cents a week! Had he had for the truth the regard that his titles would lead us to expect, he should have announced that students could slowly *starve to death* on 50 cents a week; for even in this favored land it is impossible that any man or woman can buy enough decent food for 50 cents to live on for a week. The Rev. T. DeWitt Talmage, speaking on this starving process in colleges and the effect it will have on mental vigor, gives the bill of fare to which some theological students have been reduced, and then exclaims: "Out of men thus fed we expect to make 'sons of thunder'. Sons of MUSH!"

Insufficient food thins the blood, pales the surface, consumes the fat, leaves the frame emaciated and angular, debilitates the muscles, weakens the general activity, makes prolonged exertion impossible, establishes a low form of feverishness, creates "nervousness," produces unrefreshing sleep, retards and finally confuses mental action. Dr. Parkes kept a strong man on fat and starchy foods, and the man's vigor was retained for five days and then fell notably; in a man whose meat diet he reduced one-half the accustomed quantity, the vigor was retained seven days. Deprivation of these foods beyond the time named, leads to "great loss of muscular strength, often mental debility, some feverish and dyspeptic symptoms; then follow anæmia and great prostration." The great liability of insufficient or improperly mixed food to produce such forms of debility as make the ill-fed exceedingly prone to typhoid, typhus, and malarial diseases, and to camp diarrhoea and dysentery, has long been known. The best and most alarming illustrations of such deprivations are found in the frightful rav-

ages of the pestilences which have always followed on the heels of famine. Hearty eating with a hearty digestion conduces to vigor, to physical and mental energy, to great resistive powers and aggressive force, to endurance and to achievement.

Every man should eat his food with a relish, the *good* things of this earth being given us to enjoy because there is health in their enjoyment. A meal eaten with a pleasant appreciation of its excellences, at once becomes immeasurably more digestible than if eaten in an unhappy and unappreciative spirit. Digestion is always and everywhere favored by cheerfulness and joyousness at meals; and the little harm done by the untimely and excessive eating usual in parties and other large companies, is no doubt because of the hilarity and good-fellowship incident to such gatherings. The man who comes to table in a morose state of mind, allows himself to be engrossed with business, or with little pettulances, and to be exercised about the healthful qualities of this or that dish set before him, misses the enjoyment of a good palate and is hastening rapidly on the road to dyspepsia.

"Laugh and grow fat" is an old saying with pith in it. Hearty laughing is always healthful, but is doubly so at meal-times. It stirs up the blood, equalizes the circulation, gives ease and balance to the nervous system, brushes the cobwebs out of the brain, and puts glow into every nook and cranny of the body. A sombre, churlish, sedate and "finnicky" man never can have proper digestion, and gets very little benefit from the food he minces and worries over. A jocund, chatty, story-telling, laughing man rarely fails in his digestion, and is likely to get the full benefit of each mouthful he eats. When I say laughing, I do not mean the little, simpering, insignificant hi, hi, hi, that sticks in the throat and is of no use to the body. I mean the vigorous, side-shaking haw, haw, haw, that goes to the bottom of the lungs and stirs up the abdomen with its heartiness. Laughers of this class are slow eaters yet substantial ones, usually put good flesh upon their bones, and are total strangers to the gaunt dyspepsia that follows men of gloom.

One should ascertain what especial articles of food are likely to be unpleasant to his palate or disagree with his digestion, refrain from the use of these, and then use the agreeable food in a spirit of thankfulness to the merciful giver of all good gifts. It is always exceedingly desirable to cultivate a taste for the usual articles of diet, so that one may not be "odd" among others at

the table. And this can generally be done with a little perseverance, aided by a desire to enlarge one's list of good foods; but if a person nurse his supposed dislikes to a particular dish by never tasting it, he will never know the secret of its pleasantness to others. Few people learn to relish tomatoes, parsnips, turtle soup, and quite a number of other articles of food, except after repeated trials of small quantities. At first they are abruptly denounced as "not fit to be eaten," though millions of people use them. After a little education in their use, they are relished and perhaps enjoyed with great heartiness. He who can most readily adapt himself to unfamiliar dishes, is farthest away from dyspepsia.

But it is a fact very frequently observed, that a person may not be able to use an article of diet that most other people use freely. It may be agreeable to his palate, he may even be fond of it; and yet it always disagrees with him, though he may have no apparent disorder of the stomach, and can easily digest foods that are usually more difficult of digestion. Some persons are made uncomfortable if not actually sick by even a small quantity of cabbage, or cheese, or honey, or strawberries, or peach, or melon, etc. It is useless for them to make trial of the particular article that previous trials have always shown to be objectionable to them. Having tested the question and found they cannot eat a certain food, they should lay it aside firmly and not be continually overturning the stomach by forcing upon it a disagreeable article, no matter how fully it agrees with other people. These individual peculiarities in healthy people cannot be accounted for; but their existence is an every-day fact, and has to be accepted though unexplained.

It has become the custom to eat three meals a day, and a very good custom it is. The time between these meals is sufficient for their complete digestion, and then for that period of rest absolutely needed by the stomach,—for the stomach can not work all the time, but must have a space for quietude and repose, just as the muscles and brain must have a resting time. Certain hours having been adopted, it is desirable to have the meals served very closely to these hours. At the accustomed time for receiving food the blood sets up an extra flow toward the stomach and prepares to secrete its gastric juice; and the entire nervous system may be said to turn its attention toward that organ, for from first to last the nervous system presides over every step in the nutrition and repair of the body. If, now, food is not supplied at this

accustomed time, "hunger headache" and other unpleasant feelings ensue, which to slender persons may be quite uncomfortable or even prostrating. It is proverbial that nervous irritability is aroused by delay of meals, and few men fail to get cross if kept waiting for dinner.

Yet this stomach is an exceedingly accommodating organ within any reasonable limits, and will soon adapt itself to a change of meal-time. When new hours are chosen, the sense of hunger that arises at the former hours of eating will abate then and be transferred to the new hours. The extent to which this will be done is illustrated in the life of business men in our large cities, who are compelled to reside so far from their offices as to make it impossible to go home for the usual noon meal. In a few months we find them dropping the previous hearty noon dinner to a mere luncheon; and then when they return to their family in the evening, eating a heavy dinner of meats, vegetables, dessert, etc., at seven o'clock. And this change is made without detriment, *provided* due time for digestion of this night dinner is allowed before retiring, though hearty evening meals are to be avoided as a rule. From this some fall into the habit of eating no luncheon at all, taking only a morning and an evening meal. Many laborers, on the other hand, eat the usual three hearty meals, and besides have a pretty substantial lunch between breakfast and dinner, and another lunch between dinner and supper. Their heavy muscular toil demands a food supply that would be death to the stomach of the student or the business man.

They who do little muscular work can allow the longest space between their meals, provided their digestion is vigorous; and such persons, during middle and later life, with good flesh, do very well on two meals a day. But children need food at shorter intervals; and adults of slender frame with small stomachs cannot eat enough at one meal to supply them for five or six hours, and generally do best by taking some light nourishment between meals. Whatever be the hours for eating, they should be adhered to with regularity, and changed only under necessity. It is a good thing to allow children light food five times a day, but it is a bad thing to allow them to eat at different hours on different days. The great activity of children is equal to the heavy muscular toil of the day laborers, and should be fed accordingly on foods suited to their years; but they should also be lead to imitate the precision of the day-laborer in eating at fixed hours, and not

at uncertain hours nor almost continuously. The present common system of holding one prolonged school-session per day in cities, is a violation of physiological laws in eating and studying, and is undermining to the digestion and the nervous system of the young people. Eating at a brief recess allows no adequate time for digestion before study is resumed ; a hearty meal is likely to be eaten on reaching home about 3 o'clock ; and then the evening meal of the family comes too soon for suitable rest of the stomach after the 3 o'clock meal.

It is never advisable to eat too soon after severe exertion, nor to resume hard exertion too soon after eating. During digestion, a much increased quantity of blood flows toward the stomach. This inward flow of the blood is a necessity to the function, and never fails to take place. It is also a necessity to all other organs when in the active discharge of their office. Hard labor always increases the flow of blood to the muscles ; and if the labor or exertion is heavy during digestion, the blood will be drawn away from the stomach to the muscles ; and the digestive process will then be retarded, or stopped altogether, from the reduced amount of blood in the stomach. A full period of rest at meal-time is, therefore, needed to restore the tired muscles and to promote digestion in the stomach. A person fatigued should rest about half an hour before beginning the meal ; and then should not resume muscular exertion till half an hour or more after the meal. On the other hand, complete quietude during the ordinary time of stomach digestion (two to three hours) is a decided disadvantage, and is the more unadvisable when the meal is hearty. Persons lying down and sleeping for a couple of hours after a heavy noon meal, feel half sick when they waken ; and those who take no walk or other light exercise after a heavy evening meal, and retire early, are pretty sure to sleep ill, and have a clammy mouth and a poor appetite in the morning. A nap of only ten or fifteen minutes after a hearty noon meal, is restful and desirable.

On the same principle, mental labor should not be carried on during digestion. Study or close thought invites a strong flow of blood to the brain ; and will greatly reduce the amount left to the stomach for digestion, besides taxing the nervous energies too severely at such a time. Let mind and muscle have good rest while the stomach is busy at work, and the result will be greatly to the benefit of all the structures. Nothing is more unwise, or more surely promotive of dyspepsia, than carrying one's business

anxieties and woriments with him to his meals. The "shop" should be laid aside when one comes to the table. It is no place for surliness, or gloom, or business calculations. If you would enjoy that natural condition which is embraced in the idea that "a man has the best stomach when he is unconscious of having a stomach," then leave all such things behind you when you sit down to eat. Make every meal an occasion of pleasure and of mental relaxation, paying no heed to any sources of anxiety or of hurry, taking ample time to enjoy the food to the utmost. By such a course, digestion will be kept sound and many a mistake in one's diet be made harmless.

Rapid eating is almost a National vice with us. Dickens was not far astray in his portrayal of the unseemly haste of Americans in dining. Where other people take an hour to a meal, and chat together as they eat, we take twenty minutes or less and do the least possible amount of talking. It seems almost a race as to who can pitch into his stomach the largest amount of victuals in the shortest space of time. In the rush to get back to work or to business, the meals are managed as if they were so much time wasted. I think the majority of Americans occupy an average of about fifteen minutes at a meal. It is an ungainly procedure, without pleasure and without good fellowship. It is hastily "digging one's grave with his teeth." In such eating there is no proper mastication of the food, no opportunity to relish it, no consciousness of when the stomach has had enough. Excessive eating and the lamest kind of digesting are the results of this unwise haste. An hour spent at a meal, enlivened with cheerful conversation, seasoned with a determination to enjoy the food without mincing over it in apprehension that it may hurt the stomach, or that five grains too much may be eaten, is worth two of the best working hours of the day.

Persons differ greatly, as already intimated, in the amount of fluid they need at meals, as well as during the day. Some need but very little; and these are mostly people of nervous temperament and spare build, whose blood-vessels are not large and who use but a small amount of food. Others require considerable; as those of sanguine-lymphatic temperament, hearty eaters with ample stomach and large blood-vessels. Each person must ascertain for himself what quantity of drink is best suited to him, both at meals and other times, and then govern himself according to this knowledge. A stomach in reasonable health, aided by the exercise

of a little common sense on the part of its owner, can safely be left to determine the quantity it needs at a meal, without rushing to the one extreme of flooding itself with drink, or torturing itself into the other extreme of not drinking at all while eating.

During warm weather, it is common for hearty people to run into excess of drinking at meals, and thus to dilute the gastric juice and impair digestion. If a habit of fast eating has been acquired, it will also become a habit to wash down the food with some drink at each mouthful, rather than with the salivary fluid; and thus a large excess of fluid is likely to be taken. But a moderate amount of drink used during the meals, is desirable as well as pleasant. As a rule, that drink should be warm (not scalding), iced drinks and iced dishes of any kind chilling the stomach and often arresting digestion to an uncomfortable degree. The most wretched of all warm drinks is hot water with a little milk. It is relaxing and weakening to the stomach, and softens this organ till it has no power to secrete its gastric juice. Far better use no drink at all; or use some cold water (55° to 60° F.) which has the effect of giving some consolidation to the tissues in the stomach, thus favoring gastric secretion.

The common habits of using tea and coffee are founded in a need of the system; and both these drinks are stimulating and refreshing to the nerves and usually grateful to the body at large. Some use them to enormous excess, just as they use good food to excess; and some find they can not use them at all, and therefore should put them aside,—especially coffee, which induces decided biliaryness in some persons. At times it is advisable to have some acid drink—as buttermilk, or lemonade, or vinegar with sugar and water—at or after the noon or the evening meal. Chocolate and cocoa contain a large percentage of vegetable oil, and can be used by some persons to advantage when the diet is chiefly farinaceous and vegetable, and but little fats are obtained from other sources. Where a full share of fatty aliments is taken in the way of meats, butter, gravies, and milk, these drinks are likely to be in excess of the needs of the system and to cause biliaryness.

Some foods are spoken of as "light," because they are digested easily and promptly; and hence are suitable to children and young persons, and to those whose digestion is naturally feeble or has been impaired. Others are spoken of as "heavy," because they are digested slowly, and only by those with vigorous powers and strong gastric juice. The annexed table will give a fair idea of

the time ordinarily occupied by the stomach in digesting certain articles. Of course it is only an approximate table, yet it is sufficiently near to the common facts to be serviceable.

Time Usually Required for Digesting

hrs. min's.	hrs. min's.
Apples, sour, raw, - - 2. 00	Eggs, whipped, raw, - 1. 30
Apples, sweet, raw, - - 1. 30	Gelatin, - - - - - 2. 30
Apple Dumplings, - - 3. 30	Goose, roasted, - - - - 2. 30
Barley, boiled, - - - 2. 00	Lamb, broiled, - - - - 2. 30
Beans, boiled, - - - 2. 30	Liver, broiled, - - - - 2. 30
Beans, baked, - - - 4. 00	Mutton, boiled, - - - - 3. 00
Beef, boiled, - - - 2. 45	Mutton, roasted, - - - 3. 15
Beef, fried, - - - - 4. 00	Oysters, raw, - - - - 2. 30
Beef, roasted, - - - 3. 00	Oysters, stewed, - - - 3. 30
Beets, boiled, - - - 3. 45	Pork, roasted, - - - - 5. 15
Bread, Indian corn, - - 3. 00	Pork, fried, - - - - 5. 00
Bread, wheaten, - - - 3. 30	Parsnips, boiled, - - - 2. 30
Cabbage, raw, - - - 2. 00	Potatoes, baked, - - - 2. 30
Cabbage, boiled, - - - 4. 00	Potatoes, boiled, - - - 3. 00
Carrots, boiled, - - - 3. 15	Pig's feet, soused, - - - 1. 30
Chicken, fricasseed, - - 2. 45	Rice, boiled, - - - - 1. 00
Chicken, fried, - - - 3. 30	Sago, boiled, - - - - 1. 45
Codfish, dried, boiled, - 2. 00	Tapioco, boiled, - - - - 2. 00
Cheese, - - - - - 3. 30	Tripe, soused, - - - - 1. 00
Ducks, roasted, - - - 4. 00	Trout, boiled, - - - - 1. 30
Eggs, baked, - - - 2. 15	Turkey, roasted, - - - 2. 30
Eggs, boiled or fried - 3. 30	Turnips, boiled, - - - 3. 30
Eggs, poached - - - 2. 30	Venison, boiled, - - - 1. 30

The mode of cooking adopted, besides either improving or destroying the good flavor of an article of diet, renders it either more or less digestible. Foods of the best quality may be made almost impalatable and indigestible by their treatment in the kitchen,—as when a superb steak is fried “to a chip,” or a naturally mealy potato is brought to the table heavy with water, or the best of flour is made into sour or sodden bread. These are arts that belong to the housekeeper; but the effects of ill-prepared dishes upon a refined palate and a healthy stomach are simply execrable.

The amount of seasoning used in food is subject to considerable variation, for “tastes differ” here as elsewhere. Moderation in the use of salt and pepper is assuredly desirable; and if one

finds himself unconsciously getting in the habit of using amounts that seem excessive to his fellows, he will be wise in setting about a steady reduction of quantities. Spices and condiments—as mustard, red pepper, horse radish, and various stimulating sauces—are liable to excite an undue appetite and then force to an unnatural degree of digestive effort. In elderly people who find the stomach flagging a little, the occasional use of small quantities of such articles is not out of place; but it is certainly a very poor plan for young and hearty people to resort to them, and their use too often lays the foundation of severe stomach troubles.

Numerous errors have been fallen into on questions of diet. Seeing the evils of gormandizing, a class of writers evolved from their speculating brains the rule that all persons should leave the table hungry at every meal. This may do, in a fashion, for gormands,—whose appetite runs away with their judgment, and who eat too rapidly for the stomach to have any chance for knowing when it has received enough. But those who eat slowly, and without pondering over each mouthful of food with fear, may safely trust their appetite to determine the amount they require at each meal. Such persons will naturally stop short of repletion, and be in no danger of injuring themselves by reasonably satisfying the demands of the system as made known by the sense of hunger. It is only when the stomach is weakened by disease, and its functions perverted by faults in diet, that it can not safely be trusted to decide when it has had enough. These are the exceptional cases, and need a little judicious watching; but such stomachs are not to set up a rule for persons in good tone and in comfortable health.

Ills enough are due to over-feeding, but it is folly to ascribe all the diseases of the race to that cause. Many dyspeptics suffer and groan, through long years of trouble, and attribute all their misery to the amount or quality of the food they eat, or to the mode in which it is cooked; when perhaps the real trouble is to be found in hasty eating, or in taking their business cares with them to the table, or in eating thoroughly good food in a state of trepidation that would destroy the powers of any stomach. Or, still more general, they do not get enough or do not take enough out-door exercise to work off the waste elements in the body; and then the system has but small claim for food, and the little that is taken serves a very poor purpose. Better look about and learn what influences are promoting dyspepsia, and set them right

rather than constantly inveigh against the use of a proper amount of food. Full eating is a necessity for muscle and brain; and he who would work effectively with body or mind, must have a sufficient amount of food to do it upon. Let him regulate the quality of that food to suit his calling. The brain-worker then has especial need to take daily physical exercise to an extent sufficient to make nutrition and waste throughout the body balance each other.

An error into which many excellent people have fallen, is that of restricting themselves to an absolutely vegetable diet. Many can live on vegetable foods; many do live on them, but find it necessary to include milk (animal) or to have some vegetable oil. But these are exceptions among men; and the scattered tribes in warm regions who subsist principally upon rice and similar articles, are far from being among the vigorous mental and physical peoples of the earth. What is true of those tribes is equally so of individual vegetarians; and nations and persons are forceful, when they combine a goodly portion of meats with their farinas. This is not a question of *sentiment* but of *science*; and these bodies of ours—which we must remember are *animal* in their structure—are constituted to require a proper share of animal foods (p. 127), and do best physically and mentally on a “mixed” diet.

Persons engaged in hearty muscular labor, demand a more concentrated diet and more meats than those pursuing mental or sedentary occupations. Vigorous toilers use up and then throw off the nutrient elements, and the more so if they labor out-of-doors; hence they require food that will replace that waste in the most *direct* form, and maintain their digestion in a condition that can use large quantities of meats. But it is a mistake for such persons to conclude that all other people, regardless of constitution or occupation, should use the same diet upon which they thrive. Children and elderly people, as noted in the chapter upon age, can not use much meats. Students, clerks, and professional men of all classes need a really generous diet, but could not digest the heavy and fatty animal dinners that are quite acceptable to farmers and day laborers who are much in the air. Even farmers' wives and daughters, though often over-taxed and wearied in household labors, can not thrive upon the daily round of salt pork and gravy that the “men-folk” live upon so much; and many a woman and child in the country suffer for lack of the fresh lean meats—trying in vain to make up the deficiency by resorting to rich cakes and fatty pastry that are almost indigestible.

An error in dietetics now thrust upon the public by advertisers, is that of attempting to determine foods by chemical constituents. Americans catch at the idea as they do at other novelties, and rush after it with zeal. As the brain contains a little phosphorus, the speculation is started that all the nerve-weariness incident to American hurry, drive, over-study, over-business, bad diet, and tobacco, is because this fraction of phosphorus has been consumed. Another step, and it is concluded that a supply of phosphorus compounds will replenish the waste and make up brains. Avaricious manufacturers catch the "craze," and at once the country is loaded with phosphates, hypophosphites, malto-phosphates, vitalized phosphates, etc.,—enough of them to supply as much phosphorus as the entire human race has needed from the time of Adam. If phosphorus and its chemical compounds would supply brains, one would be astonished that there remain so many shallow-pated fellows among us. We would be a Nation filled with Solomons, if the advertisements of manufacturing chemists and laudations of respectable medical journals were but half true.

The simple fact is, that the human system does not feed upon chemical compounds. It wants its aliment prepared in organized forms; and will use only very limited portions of any chemical substances—as salt. While phosphorus, lime, and some other inorganic substances exist in the body, they can not safely be fed to the stomach; but require first to be elaborated by the vegetable kingdom, and after that to be used by animals and man. A crucible in a chemist's laboratory is a very different affair from the marvelous living stomach; and the uses of the two are totally different, and these uses cannot be interchanged. Chemistry deals with substances and their elements when dead, but never when living; and it never can transmute a dead element into a living tissue, nor impart a vital function to any combination of elements. These are offices performed only by the Life Principle (p. 10); and no combination of elements that chemistry ever put together, can by this Life Principle be fashioned into a living tissue.

Mischief of considerable proportions has already resulted from these attempts to supply the wants of the system by so-called "chemical foods." In the one class of phosphorized mixtures, small quantities of them will soon furnish all that the body could require, and then the remainder becomes dangerous foreign material to be carried out of the body by different organs. It puts a heavy strain on the organs to get rid of them; and frequently can

diseases of the kidneys, stone in the bladder, and other maladies, be traced to the use of hypophosphite syrups to replace lung tissue in consumption, and blood corpuscles in anaemia, etc. Wheat, oats, corn; beets, peas, parsnips; berries, apples, peaches; beef, mutton, fowl, fish,—these and other articles of our common food contain the very small amount of iron, phosphorus, and other metallic compounds required by man. They also hold these substances in forms that the human stomach and other organs can use. Let us employ the foods that Nature has provided, and avoid all forms of "chemical foods"; and we will be in the way of obtaining the best nourishment, and escape an evil that seems devised for the sole purpose of filling the pockets of manufacturers.

CHAPTER XVIII.

REGULATION OF THE CLOTHING.

A PRINCIPAL use of clothing is protection of the body against the changes of heat and cold and the common inclemencies of the weather. According to the character of the articles worn, clothing either favors radiation of heat from the surface, and thus promotes coolness in hot weather; or retains the heat it receives from the body, and thereby promotes warmth in cold weather. Linen is the most rapid conductor, and can be worn in summer and in the tropics; but its use next to the skin in the cold winters of the middle and northern zones, would make it impossible to keep warm. Cotton fabrics are slower conductors than linen, carry less warmth away from the body, and also convey less heat from the sun to the body; on which account, as also for its cheapness, it forms a large portion of our clothing. Woolen goods are much poorer heat-conductors than cotton, hence are used extensively in winter; the skin and fur of animals being in this class, and becoming valuable for outer clothing in high northern latitudes. Silk is the poorest conductor of all, but it is not commonly worn next to the skin except when flannels prove painfully irritating to the surface, and the purse is long enough to afford the luxury.

The color of one's clothing has quite an influence upon its conducting properties. In numerous experiments made by Dr. Parkes and others to test this, especially with reference to the

action of different materials in receiving heat from the direct rays of the sun and conveying it to the body, the following facts were observed:

When white cotton received	- - - - -	100° F.
White linen received	- - - - -	98° F.
White flannel received	- - - - -	102° F.
White silk received	- - - - -	108° F.

But when the color of the goods was changed, it was found to make a much greater difference in its power of receiving and conducting sun-heat than did the materials of the fabric used. Thus, using cotton goods,

When white received	- - - - -	100° F.
Grey or pale straw received	- - - - -	102° F.
Dark yellow received	- - - - -	140° F.
Light green received	- - - - -	155° F.
Dark green received	- - - - -	168° F.
Turkey red received	- - - - -	165° F.
Light blue received	- - - - -	198° F.
Black received	- - - - -	208° F.

The change of color in other fabrics does not make quite so great differences between white and black, yet follows the same rule. Experience accords fully with these observations of science, white and grey goods being notably coolest in summer; while a black coat or dress conveys such an excess of sun-heat to the body as to make such apparel thoroughly burdensome during the warm months. Fashion, that dictates the use of general mourning, not unfrequently adds physical to mental depression, and causes many a lady to droop with heat-exhaustion, and prevents the needed out-door life because of the prostration added by the color of their clothing to that already felt in the spirit. Women are the chief losers here; and it would be well for them if custom would change the use of deep mourning and heavy crape, to a more limited emblem of sorrow worn upon the bonnet or elsewhere. Dark goods worn in winter are most comfortable, and their selection is quite natural.

Loosely woven goods retain much air in their interstices, and are relatively warmer on that account,—air being a very poor conductor of heat. Wool is a bad conductor of heat; but it is a great absorber of water, and in proportion to its weight will retain at least twice as much as either cotton or linen. It also retains water longer, not parting with it so quickly as do the two other

fabrics. Evaporation of moisture is well known to be a cooling process. In the use of linen and cotton garments next to the body, in case of perspiration, the moisture passes through them quickly and is quickly evaporated upon their external surface without being condensed. The consequences are a rapid cooling of the skin and an almost immediate sense of chilliness. But when woolen garments are worn, the moisture of perspiration is accumulated and retained, evaporates much more slowly, and thus prevents sudden cooling after exercise or abundant perspiration.

On these accounts, flannel is most useful in protecting the body against sudden changes of temperature in both summer and winter; the atmosphere penetrating its open texture slowly in winter, and a person in a perspiration in summer not feeling draughts or a change to a cold cellar or other place. Flannel may thus be worn through the entire year, with the result of being the best guard against changes and exposures. Its thickness and texture should be very light in summer, and correspondingly heavy in winter. Its capillary fibres are pleasantly stimulating to the skin of most people; but very sensitive persons cannot endure this irritation, and should wear a mixture of silk and wool, or of cotton and wool. The advantage of wearing red flannel in rheumatism is because of the loose texture of this class of goods, and the frictional action of its numerous long fibres; the mere color having very little to do with it, for color does not materially vary the heat-absorbing properties of a fabric except as it is exposed to the open sun.

Cotton (Canton) flannel has a soft knap that is usually agreeable to the surface; but its texture is so close that many persons cannot wear it at all because it checks the escape of the exhalations from the surface.

In summing up the general observations on the values of different clothing, Dr. Parkes offers the following conclusions:

"Protection Against Cold."—For equal thicknesses wool is much superior to either cotton or linen, and should be worn for all under-clothing. In case of extreme cold, besides wool, leather or water-proof clothing is useful. Cotton and linen are nearly equal.

"Protection Against Heat."—Texture has nothing to do with protection from direct solar rays; this depends entirely on color. White is the best color; then gray, yellow, pink, blue, black. In hot countries, therefore, white or light gray clothing should be chosen. In the shade, the effect of color is not marked. The

thickness and the conducting power of the material are the conditions which influence heat.

“*Protection Against Cold Winds.*—For equal thicknesses, leather and India-rubber take the first rank; wool the second; cotton and linen about equal. [I am told that in northern Iowa and onward, they use the tightly-woven duck goods, cotton, as outer clothing to protect against the winter blizzards.]

“*Absorption of Perspiration.*—Wool has more than double the power of cotton and linen.

“*Absorption of Odors.*—This partly depends on color, in this order,—black, blue, red, green, yellow, white. As far as texture is concerned, the absorption of odors is in proportion to hydroscopic absorption; and wool therefore absorbs more than cotton or linen.

“*Protection Against Malaria.*—It has been supposed that wearing flannel next the skin lessens the risk of malaria. As it is generally supposed that the poison of malaria enters either by the lungs or the stomach, it is difficult to see how protection to the skin can prevent its action; except indirectly by preventing chill in persons who have already suffered from ague. But the very great authority of Andrew Combe, from his experience at Rome, is in favor of its having some influence; and it has been used on the west coast of Africa for this purpose, with apparently good results.”

Clothing should be reduced or increased with the changes of the weather and to suit the comfort of each person. It is not proper at any time to allow the surface to feel chilly because of insufficient clothing; neither should it be kept over-warm by too much clothing, thereby increasing the perspiration unduly, and making one tender and very susceptible to taking cold. In the spring it is not advisable to remove or to change the under-garments too early, nor upon the advent of the first few warm days. Fluctuations of weather are certain to occur in the temperate latitudes, and may be sudden and considerable; and it is often dangerous to lighten the amount of one's dress, except by the removal of a heavy overcoat or ladies' wrap and replacing it by a lighter one, until the weather is well settled toward summer warmth. Even then, the changes of under-garments would better be made gradually from a heavier to a lighter fabric, and a thicker garment resumed at any moment that a considerable fall in the thermometer occurs. Likewise in the fall, an increase of

clothing should be resorted to early, and no risks be run for lack of sensible and timely covering to suit the weather.

Children need more covering than adults, their internal store of heat being more limited and the radiation from the surface more rapid. They should be furnished with an increase of woolen clothing early in the fall, and change it late and very gradually in the spring. Mothers, who generally superintend these things, are at times found going to opposite extremes on the matter of their children's dress. One class are unduly anxious lest the little ones should catch cold, and wrap and bundle them so heavily in but moderately cool weather that the skin is kept in a nearly constant moisture, thus making play uncomfortable and greatly increasing the liability to colds. This error comes from loving tenderness, but is nevertheless an error and often causes unexpected trouble.

Another class of mothers (but far more usually the fathers) think it desirable to "toughen" their children; and imagine this can be done by withholding an increase of winter clothing till the weather has become severe, and even then not allowing them sufficient to keep them thoroughly warm. Such a course is simply cruel, and displays a marvellous lack of tender feeling as well as of good judgment. Because too much clothing makes a child needlessly tender, it does not thence follow that too little makes it hardy. This plan reduces a child's surface warmth too much, stagnates the skin circulation more or less, keeps the child looking pinched and blue with coldness, makes it feel miserable and spiritless, and holds it in a state of depression that any moment may rush the little one into a dangerous bronchitis or pneumonia.

It should be a rule always to keep a child comfortably warm without sweltering it with an over-load of clothing. Far better have quite too much than a fraction too little; but with good judgment it is not necessary to go to either extreme. When children are old enough to play actively, and thus to start a brisk perspiration in weather that is only moderately cool, they should be taught to lay aside some outer garment when they engage in play, and to resume it promptly when the play is at an end. With a little care and patience, children will soon learn to do this and save their own health very much. Even though in a perspiration, the outer garment should be resumed when the play or exercise ceases; for a few moments of neglect then may give a dangerous chill, and the more so if the child stop in a windy place or sit in a draught. And children as well as adults should be clad evenly,

so that all parts of the body, abdomen, chest, limbs, hands, head, should receive equable and sufficient protection. It should also be borne in mind that a pound-weight in woolens next to the skin, is better for warmth than two pounds in the way of outer garments. Make the change of increased under-clothing early and abundant, and use the wraps and overcoats later on in the fall; and reverse this order of change in the spring, lightening the under-clothing last.

Ladies, and also gentlemen, sometimes do themselves an injury in the use of furs by putting them on too early in the fall. Such covering is suited only to very cold weather; and when resorted to so soon as the thermometer falls to the range of freezing, it softens and opens the surface too much for good health. Far better use lighter wraps till the weather gets to an average of a number of degrees below freezing, and then the seal-skins, etc., will be of genuine advantage and comfort. So far as the neck is concerned, however, it is decidedly questionable whether furs should be worn around it in any but arctic weather. Heat the throat too much, and colds inevitably follow any sweating about the neck induced by fur mufflers and tippets. I have known many a lady ruin a fine voice by too much bundling about the neck.

All clothing should be worn with moderate looseness. If tight, it interferes with a free circulation,—as when tight boots keep the feet cold by pinching the veins and arteries, thus limiting the flow of blood. Tight clothing may also restrain the action of internal organs, as when a lady's corsage curtails the movements of the lungs and abdomen; or a lad girthing himself for some athletic effort throws an additional strain upon the heart, or may endanger rupture. No detriment comes from a garment that fits the body or any of its parts evenly and closely; but when it presses upon them so as to reduce the normal size, shape and movements of any part, it cannot fail to be a detriment according to the degree of this unnatural pressure. Growing children especially suffer when cribbed by tight clothing; and those taking exercise and doing physical labor, need the utmost freedom in every garment, tight clothing proving cumbersome and restraining easy motion.

Elderly people, getting thin of blood and reducing the amount of their physical exertions, require more clothing than those in middle life. Indeed the aged demand the utmost care in preserving the warmth of the body in every way.

Since aniline dyes have been introduced, the bright colors they

give to hose and other garments have proven attractive but are often dangerous. Aniline is poisonous, and the reds and greens are especially poisonous. The perspiration often causes these colors to leave the goods and cling to the skin, staining and irritating it. Very many persons feel the poisoning effects in a few days, suffering extreme itchiness, redness, eruptions, and even sores. Some persons absorb these dyes and suffer a long train of skin diseases in consequence, recovering slowly and with difficulty even after discontinuing the article of apparel. A single piece of clothing may do mischief; and it will be advisable to avoid those bright goods that are made so attractive to the eye by aniline.

Beds.—Beds and bedding should be regulated on the same principles as the clothing worn upon the body. About one-third of our time is spent in bed, and due provision should be made for the most perfect comfort and protection while there. Elsewhere (p. 33) mention has been made of the need of a gentle warmth in all sleeping apartments. “There is a widespread delusion among otherwise intelligent people, to the effect that cold air is necessarily fresh air. But this is far from true. A bed-room into which a gentle current of fresh and warmed air has been passing the night long, is much more likely to be free from foul air in the morning than the same room with all heat turned off and hermetically closed. There is also much less danger of catching cold in a slightly warmed bed-room while dressing and undressing. If the atmosphere of the bed-room is too cold, an extra quantity of covering must be placed upon the bed, tending to impede the free breathing of the sleeper, and to prevent to some extent ready transpiration by the skin.”—(*A. Van Harlinger, M. D.*). But an over-heated bed-room is relaxing and debilitating, preventing full and quiet sleep.

Bedding may be quite too heavy, and cause restlessness, nervous uneasiness, and even perspiration. This is frequently the case with children when the anxious mother covers them too much; though it must be remembered that a child may be restless at night from playing too violently during the day (p. 114), as well as from being burdened with bed-clothing. A person lying down or sleeping has a slower circulation than when sitting up, and much more so than when in motion; hence more covering is then required to protect the body in cold weather, even while an undue excess is avoided. It is an exceedingly uncomfortable thing to get chilly in bed.

A traveler writing of his experiences in Cuba, related the fact that he could not at first keep himself warm in bed though supplied with plenty of blankets, the sea-breeze at night being cool in that island. After tossing in chilliness a few nights, he told a friend about his discomforts. His friend asked him what kind of a bed he slept on. Upon a canvas cot, was the reply. Well, said his friend, put one of the blankets under you and you will be warm enough; for you seem to have forgotten that a man must be warm all around him in bed as well as out of it.

Hair makes the best mattress; cotton the next best; straw is also excellent when suitably laid and kept; shucks of corn are good. The poorest bed a man, woman, or child can sleep upon, is one of feathers. Though always pleasant to the feeling, such a bed is too retentive of warmth, and over-heats and relaxes the body, even in winter time. Millions of people sleep upon them; but millions used to live in mud hovels, and the fact of multitude does not make anything right. Wire mattresses are elastic and comfortable, and may be covered with a cotton mattress.

All-wool blankets of the best quality make the best bed-clothing for purposes of warmth, at the same time allowing a proper transpiration of bodily exhalations. Several thin ones are better than a single heavy one. Cotton comfortables are most common for general purposes of covering. The cotton padding should be as fluffy as possible, and not too thick; when it becomes packed and hardened, it makes a very poor covering. It is a distinct mistake to use any impervious material in a bed cover for the sake of warmth; for while it retains the heat, it also retains the exhalations and thus becomes a dangerous article. All bedding and beds should be aired thoroughly every day.

CHAPTER XIX.

BATHS. BATHING. THE SKIN.

BATHING or washing is employed for the great purpose of cleanliness,—“which is next unto godliness.” But it is also of great value for the important impressions that may be made thereby upon the circulation and upon the nervous system, both in health and in disease.

The skin in a composite structure, performing varied offices and exerting a variety of influences upon the general system. It is richly supplied with blood, the minute capillary blood-vessels that ramify through it as an unending net-work being numbered by millions. When these are reduced in their calibre by exposure to cold and to dampness, much of the blood is forced out of them and compelled to accumulate upon other and more central organs. A few minutes of such exposure, and the entire body of these capillaries may be nearly emptied by the narrowing or contraction that cold produces upon them as upon all things. This represents a rush of blood, to the amount of many ounces, away from the surface and toward those organs which are softest of structure and most yielding to this in-flow. The lungs, the air passages, the pleurae, and the bowels, are the parts most likely to receive this current thus forced inwardly. The blood-vessels in these parts are thereby distended and swollen; and thence follow the usual round of colds, congestion of bronchi and lungs, bronchitis, pleurisy, pneumonia, congestion of the bowels with pain and diarrhoea, etc.

The skin also contains millions of nerves; and no impression can be made upon these without being transmitted to the other parts of the nervous system, to the spine, and to the brain. Minute injuries on the skin produce suffering; and the shock of an extensive burn or scald may be so great as to overwhelm the entire nervous system and cause death, even when there is no actual destruction of tissue.

Millions of sweat-glands also enter into the composition of the skin,—little spiral tubes that carry away moisture without cessation; and along with it (or dissolved in it) various salty or saline matters, together with animal exhalations that need to be removed from the system, and some carbonic acid gas (p. 45). In the course of twenty-four hours, an adult man in repose throws out from his skin about two pounds of moisture in the form of unseen vapor, called *insensible perspiration*; and along with it from one to two drams of salty matters, animal exhalations, and a volatile organic material of varying odor—not including the odor of tobacco given off so offensively by the users of that article. Exercise at once increases the amount of this secretion, and this in proportion to the violence of the exertion, till it becomes *sensible perspiration*,—which also appears abundantly under the influence of a heat greater than that of the inner body (98° F.), even when a person

is in repose. Accompanying the hairs, wherever these appear on the skin, are small sebaceous glands, which secrete an oily lubricating material for the hair and the general surface; and these are nearly as numerous as the perspiratory glands.

Evaporation always carries off heat, and this is one great purpose served by the perspiratory function. It keeps the surface cooled; and as exertion increases the circulation and the internal heat, an increase of perspiration at the same time carries off the surplus inward heat and prevents that accumulation of it which would quickly endanger life. Only by this beautiful balance is it possible for man to endure the high temperature to which he is commonly subjected by the weather, the sun, and his occupation. So soon as this transudation by the surface is checked, fever arises and danger begins. A "dry" surface is uncomfortable, and irritates the surface nerves. The salty and organic materials cast out with the perspiration, though small in relative amount, are repugnant to the body, and soon disease the blood if not removed.

From these composite characters and offices of the skin, it will be seen that its preservation in a healthy state is of much importance; and also that baths will not only benefit its superficial cleanliness by removing accumulations of dust, dirt, salty excretions, and worn-out cuticle, but will exert more or less decided influences upon the surface nerves and the circulation. The character of a bath will determine much of the character of its influences, and this depends largely upon the temperature. A *cold* bath ranges from 70° F. down to 50° F. A *tepid* bath is from 85° to 95° F.; from 75° to 85° F. being commonly considered as *luke-warm* or *temperate*. A *warm* bath ranges from 96° to 104° F.; and a *hot* bath from 104° to 110° F., beyond which it is classed as *very hot*, and is rarely used.

I. *Cold Bath.*—A sudden application of cold water gives a slight shock to the nervous system, more or less marked according to the sensitiveness of the person and the range of coldness. If continued beyond two or three minutes, the water absorbs a portion of the heat at the surface and reduces the temperature of the skin; and if prolonged, the blood and the tissues beneath the surface lose some heat. The blood in the capillary vessels, as above mentioned, is partly driven from them by the contraction of these vessels caused by the cold and by its impression on the nerves; and thus the surface is paler and the blood accumulates about the heart, lungs and other internal parts. In a little while, the heart

is aroused to increased action by this flow of blood upon it; the beats become more hurried, and now the blood is thrown back to the surface with increased force and in larger quantities, putting the skin in a ruddy glow.

When this reaction takes place promptly and with vigor, the general result of the cold bath is invigorating and toning, and is of decided general value. But if the bath is too cold, or if the general strength is low and the heart is feeble, reaction may be feeble and slow. In such cases, the surface remains pale and shrunken, a general sense of coldness supervenes, the blood remains over-crowded on the lungs and other internal organs, and the system is everywhere depressed. Under such circumstances the cold bath becomes a cause of much disturbance and frequently of direct mischief. It should not, therefore, be used by the feeble and emaciated, nor where it gives rise to an uncomfortable and a prolonged feeling of coldness. Neither should it ever be much below 55° F., even for the robust and for those who enjoy it most; nor be prolonged beyond a few minutes. Young children should rarely, if ever, have a bath below 60° F.; and the habit some people fall into of breaking the ice in cold weather to get water for a bath, and then of taking it in a cold room, is quite creditable to their courage, but a humiliating evidence of little information and less judgment. Boys many times stay too long in the cold water when they go swimming, and are chilled and materially weakened by doing so.

Cold baths have of late years been much lauded in fevers. Of course the application of cold water for an hour or more will absorb the heat from the surface and lower the general temperature. But such a course is so promotive of internal congestions, besides checking the perspiration and preventing the escape of foul material from the skin, that it has proven a very unsatisfactory measure.

II. *Lukewarm and Tepid Bath.*—The range of temperature included in these baths makes them the most agreeable, and for the majority of purposes the most desirable. Such degrees of warmth and moisture soothe the nerves of the surface and impart a quieting impression to the entire nervous system. They gently relax the capillaries and invite more blood to the surface, yet without making any special impression upon the general circulation except in a mild way to relieve internal blood-pressure and inflammation. Such baths, being below the internal body heat, lower the general temperature a little; and they open the secreting glands and secure

a somewhat freer perspiration. Because of these several actions, these baths are peculiarly desirable for fevers, and for nervous feverishness; and are always the most suitable baths for little children and for all delicate persons. Those temperatures that are nearest the cold bath are best suited for hysteria and St. Vitus' dance; though a moderately cold bath is equally suitable for these troubles. A tepid bath may often be continued for half an hour to an hour; but should not be prolonged, nor even repeated too frequently, with feeble persons, as it is relaxing and may be made to debilitate the system. Children are often made drowsy by such baths, which is an evidence that the bath should be made very brief indeed.

III. *Warm Bath.*—At these higher temperatures, the bath still further increases the flow of blood to the surface, stimulating it and greatly relieving internal pressure and congestions. It also proves moderately stimulating to the general circulation, promotes the glandular functions of the skin, hastens the free development of eruptions, (which cold baths retard dangerously), and aids greatly in the elimination of poisons. Baths of this kind are well suited to most persons who have passed the meridian of life, to the fleshy, and to many skin diseases as well as the eruptive fevers. A distinctly warm bath should generally be brief, extending fifteen to twenty minutes.

IV. *Hot Baths* are highly stimulating to the surface, reddening it pretty soon with the rush of blood into the capillaries. They hurry the circulation and breathing, and help to start an active perspiration. In feeble persons, and those with debility of the heart, a hot bath may invite so great a flow of blood to the skin as suddenly to leave a deficiency in the brain and heart, when faintness will follow and the breathing become quickened and anxious. Hot baths are mostly used for distinct coldness or obstructions of the surface, receded eruptions, and some severe chronic rheumatisms and neuralgias. They should seldom be prolonged beyond eight or ten minutes, and never used at all in debilitated conditions; and generally they should be preceded and accompanied by draughts of hot ginger or composition tea to sustain the inner circulation and keep an equilibrium between the heart and the surface capillaries.

Active motion, as in swimming, stimulates the general circulation, and thus prevents the chilling impressions of a cold bath from becoming suddenly intense. Friction after a cold bath also

hastens the return of blood to the surface, and may be applied briskly and firmly if such a bath leave the surface too cool. Friction has a distinctly stimulating effect, and also checks the perspiration; hence after a tepid or warm bath, when employed for the especial purpose of soothing the nervous system and leaving the perspiratory glands open, friction should be light and gentle,—only a quite soft towel being used, and this merely to get the skin fairly dried with but little rubbing.

Partial baths—as to the feet, the hips, the abdomen, etc.—have the same local effects as general baths of the same temperature. They are usually either tepid or warm, and given for the purpose of diverting the blood from other parts,—as from the head, the pelvis, the bowels, etc.,—and frequently afford much relief. Some stimulant,—as salt, mustard, or red pepper,—is frequently added to the water of a partial bath when the circulation is feeble or the adjacent organs are congested.

It is not always necessary for a person to get into a bath-tub in order to have a general bath, although this method is the one held in mind in the foregoing descriptions. A *sponge* bath, using a towel or sponge with a few quarts of water, may be made equally general. It has an advantage in not exposing the whole body at one time to the water, which is not always pleasant nor suitable to delicate and feeble persons, and is impossible or injudicious to many sick persons who need baths. By the method of the sponge, a small portion of the body may be bathed and dried and covered, using such temperature of water and amount of friction as may be desired; and then another portion may be treated in the same manner, till every part has received a proper washing. This is also less fatiguing to invalids than any other mode.

Vapor Baths.—For these we employ steam from water, the person being in a box and the temperature rising to 100° , 110° , or 120° F. A higher vapor heat can be borne than in a simple water bath. The effect is a strong invitation of blood toward the surface, a corresponding diminution upon the internal organs, and the procurement of a free perspiration. This form of bath is a fine luxury, and has become very popular, though at one time extremely unpopular through prejudice. It is of great benefit in cases of dry and cold skin, some neuralgias, recent colds and catarrhs, rheumatism with cool surface and stiffened joints; in eczema and most other skin diseases, and including constitutional syphilis. For a few minutes it causes a little hurry and oppres-

sion of breathing, which pass off when perspiration appears. It should not be continued beyond twenty to thirty minutes, with most persons; and some get into a goodly perspiration in ten minutes, and should not then stay in the bath more than three to five minutes longer. When its temperature is too high, or it is too much prolonged, some persons have the blood diverted from the heart so violently as to cause a severe sense of fainting.

To hasten the perspiration, and also to sustain the heart and large blood-vessels, it is advisable to drink rather freely of a hot tea of ginger or composition before entering the vapor bath. Also while in the bath to sit on a low chair with the feet in a vessel of quite warm water. Generally it is best to have the head uncovered; though a few persons prefer to have the head immersed in the vapor and to breathe it. A sudden dash of cool water should be taken on emerging from the bath, and then friction used. If the person is going abroad, the friction should be thorough, so as to close the pores on the skin and obviate all danger of taking cold. If the bath is used for the purpose of breaking up a cold, the friction should be moderate, and the person go to bed in a fairly warm room; which plan will secure a prolonged and gentle perspiration, and then good friction may be used. A person troubled with rush of blood to the head, palpitation, organic heart disease, or a tendency to fainting, should not employ the vapor bath.

In the famous *Russian bath*, a large room is filled with steam; and the bather mounts a series of broad steps in this room, beginning with the lower where the temperature is about 104° F., and gradually mounting higher till he reaches a stage where the heat may be from 125° to 130° F. Very few persons can endure the latter temperature. The bather lies down on the broad stone step; is douched with warm water, soaped, and rubbed vigorously by attendants, slapped and rolled about, till he becomes as limber and slippery as an eel, and the cuticle or "scarf skin" loosens and rubs off. When the process has been finished, he is treated to a cool douche, rubbed down and dressed, and "laid away to cool" in another room. This is an exceedingly powerful bath, and not borne by feeble people though a luxury to the robust.

Hot-air Bath.—This consists simply in confining around the bather sitting in a box, or under impervious covering, a body of air heated by the flame of a broad alcohol lamp placed under the chair. Its action is similar to that of the vapor bath, though it promotes a much more bountiful perspiration and does it more

rapidly. These are often advantages over the vapor bath, and have brought the hot-air bath into much favor. Very frequently the vapor and hot-air baths are combined by the simple procedure of boiling water in a shallow vessel, the lamp and vessel being under the chair upon which the patient sits, or at a short distance in the rear but under the same covering. A rubber blanket, or a tight cotton quilt, is placed about the neck of the bather and falls to the floor all around him, his feet being in a vessel of hot water. This simple process is admirable for all home uses of this really valuable form of bath.

The *Turkish bath* is in reality a hot-air bath, though now generally confounded with the Russian or vapor bath. It admits a considerably higher temperature than can be endured in the Russian vapor bath, and is very much more refreshing and less fatiguing to the bather,—even delicate people usually taking a genuine Turkish bath to advantage. It is practically the same as the old-time Roman bath, with few differences. A series of large rooms, heated by various methods, is necessary. The clothing is removed in the cool room (*Roman frigidarium*); and then the bather enters the milder warm room (*tepidarium*), where the heat ranges from 115° to 130° F. Here he remains till a good perspiration appears, which is usually from twenty to forty minutes. When the perspiration becomes considerable, he passes into the higher warm room (*calidarium*), where the temperature is raised by coils of steam pipe, a heat of 140° to 160° F. being employed, and sometimes a series of elevated steps giving a temperature of 180° to as high as 200° F. on the upper stage. In a few minutes the perspiration runs down in streams. Here the attendants soap the bather liberally, and with their *hands* gently shampoo and knead him from head to foot. A few minutes are sufficient for this purpose, the bather seldom being in the calidarium beyond twelve or fifteen minutes in all. He then goes to the lavatorium, where he begins with a warm shower-bath to wash off the soap, perspiration and loosened scarf-skin; and completes the process by having the water gradually reduced in temperature to 75° or 80° F., which closes the pores and secures a vigorous reaction. He then returns to the cool room or frigidarium, where he waits twenty or thirty minutes for the skin to get completely dry, and then dresses.

Some timid persons fear the dash of the cool water after these baths, lest cold and congestion should follow from such a sudden change of temperature. No such apprehensions need be enter-

tained. The shower-bath comes while the surface is all aglow with the free rush of blood to it from the heat; the water used is rarely below 80° F., which is not chilling; and this is so brief in duration as not to give a shock to the nervous system, but rather to provoke a prompt reaction that is completed by the subsequent friction. It is alleged that the Russians used to rush from the vapor bath and plunge into water of 40° F. or less, or even roll in the snow, without damage. This might properly be called "too much of a good thing"; but it is a plain fact that a shower or douche bath of 70° F. for the hearty, and of 80° to 85° F. for the delicate, is not only void of harm to them, but completes the refreshing luxury of the bath itself. And danger would really be courted by going from such a bath without effectually closing the pores by the cool douche or shower.

Vapor baths are sometimes medicated with such articles as leaves of the spruce or the hemlock tree, wormwood, lavender, pine leaves, catnip, and other volatile articles. In some diseases these increase the stimulating or the relaxing action of the bath to advantage; but at present are not much employed.

Sea-Water Baths.—The atmosphere of the sea-coast (p. 93) is stimulating and invigorating; and is often to be sought by certain enfeebled classes of persons. Bathing in the sea is also stimulating and toning, and is resorted to by thousands for the hygienic excitation it imparts. Such bathing is also of decided benefit to some classes of scrofulous, anaemic, and brain-wearied people; and to pale and drooping and rickety children. A sea-bath is always a cold bath, and never should be indulged in beyond a few minutes by feeble persons, every second or third day; and if they find any sense of restlessness or fatigue from its use, they should not continue such bathing. Nervous and excitable persons can seldom use this bath; and many persons in health remain in the water far too long, and get blue from the surface chilling and slowly lose strength by so doing.

All the stimulating effects of sea-baths, minus the exhilaration of the ocean air, may be enjoyed at home by delicate children and others who cannot go to the coast. For this purpose, from two to four ounces of Ditman's dried sea-salt may be used in a gallon of water; and the home-bath has the advantage of allowing any desirable temperature of the water, lukewarm or tepid generally being best. It may be well to know that a genuine cocoanut-oil soap (sometimes called *marine soap*) can be used for cleansing pur-

poses in salt water. Table or rock salt may be used if sea-salt is not procurable, and is almost equally good.

A *bran bath* is made by boiling about four pounds of bran in a gallon of water, straining, and then using as it is or adding to any desired quantity of water. It allays irritability of the skin. A *mustard bath* is powerfully stimulating, a tablespoonful or more of ground mustard being added to a gallon of warm water. It is usually employed for local purposes, as to aid in a warm foot-bath or over the abdomen. A *cayenne bath* is made by adding a teaspoonful or more of red pepper to a gallon of water, and is generally preferable to mustard. *Wet compresses* are a form of local bath used in many diseases. They consist of several folds of loose flannel or other goods wrung very lightly from water, laid over the part, and then covered with one or two layers of tightly-woven goods to retain the moisture and warmth. A tepid heat is generally employed, but a hot compress is sometimes most desirable for its stimulating action. I have introduced here these brief suggestions about baths used for remedial purposes, in order to save repetition elsewhere.

Soft water is needed for all cleansing purposes, though not necessary to obtain the general impressions of the bath upon the skin and its various tissues. Hard water (p. 64) cannot remove dust, dirt, sebaceous materials and other substances from the surface; but would leave these to fill up the fine "grain" of the skin, and to stop the mouths of the glands and check the escape of sweat and of the oil. Uncleanliness remains; and obstructed sebaceous glands may have a speck of dirt lodge in their openings, and then swell from the accumulation of materials that cannot get out,—as witnessed in those little pimples on the face known as "black-heads". The hardness of the water needs to be removed by soap, or by a few grains of sal-soda to the gallon, or by saleratus or cooking soda. Some caution should be exercised in the selection of a soap; for it is not a myth that diseased animal fats are frequently used in making soaps, and that these may impart disease to the skin. Only the coarsest soaps are of such material. An *alkaline bath* requires about half an ounce of pearline or sal-soda to each gallon of water. *Mud baths* have come into vogue lately. They have no merits beyond any other tepid bath; and refined people will not care to wallow in the same warm slush where perhaps ten, or twenty, or fifty bathers have already left their excretions, their eczema, and possibly their scales of syphilis.

Hard laboring people generally need a soap of strong properties, *i.e.*, rather strongly alkaline. Women and children, and people of tender skin, have the surface irritated by such soaps and require a toilet soap of finer materials. In removing the natural oiliness from the surface, a strong soap reduces the pliancy of the skin and leaves it harsh. In the spring and fall months, the drying winds aid this action, and the hands and face are liable to get quite rough or "chapped." The use of a mild toilet soap, not highly scented, will usually prevent this. An ounce of borax in a pint of water may be used instead of soap,—wetting the wash-cloth with this, or putting three or four tablespoonfuls of the solution to each quart of water for lavatory purposes. It is a thorough detergent, and usually leaves the skin soft. If after a soap has been used the parts are rinsed with one or two tablespoonfuls of cider vinegar to a quart of fresh water, the excess of alkali will be overcome and the skin will remain much smoother.

When the natural oil is so far removed as to cause roughness, the cuticle being at the same time removed too rapidly by the frequent washings, it will be necessary to supply some unctuous material. For this purpose, a *little* glycerine may be rubbed on the hands, face, or other parts, while these are yet wet. Or sweet oil, goose oil, mutton tallow, or other similar articles may be used. Usually this is done on retiring at night. Equal parts of glycerine, bay rum and rose water make an excellent application.

Baths should not be taken when the body is fatigued, nor when one is conscious of being hungry, nor yet soon after or before any meal. Digestion of the last meal should be about completed before taking a bath, otherwise that function will be interfered with and many bad feelings arise. About two hours after a meal is usually the better time; and this in the morning is probably most suitable, though many prefer the bath in the afternoon. It is also advisable to have an evacuation of the bowels an hour or more before bathing, and this is imperative in using any form of warm bath. In sea-bathing, most persons do well to take a small cup of coffee or cocoa before the bath. Elderly people should be exceedingly cautious about general bathing, preferably using a sponge bath at intervals. In warm weather, a bath can be used more frequently than in cold weather; but some people get extravagant on this subject, and imagine they cannot live without a bath every day. This is a mistake, and many times is an injury. Once or twice a week in summer and once a week in winter, are

entirely sufficient to most healthy people; and the feeble or slender or aged cannot take them half so often. Of late years, this business of bathing has been quite overdone, and a hearty caution against it is needed.

CHAPTER XX.

REQUIREMENTS AND REGULATION OF EXERCISE.

IN order to keep the body in good health, it must have a share of active muscular exercise every day. And in order to keep the mind in good health,—free from morbid emotions and of clear tone,—it too must have daily exercise for its invigoration. The general idea of exercise includes the regular use of every organ of the body; but it is mostly applied to the muscular system, the due exertions of which have a direct and marked influence upon the circulation, the nervous structures, the digestive organs, and, in short, upon every tissue and function of the frame.

A large portion of mankind have plenty of muscular exercise in the way of hard labor, at which they get too wearied to have either time or inclination for mental exercise in the way of solid reading or studious thought. These are liable to suffer from not preserving that harmony between muscle and brain which develops the perfect man.

But another large portion of mankind do not get sufficient muscular exercise, being occupied with such in-door pursuits as permit but trifling physical activity, or with mental pursuits that are so intense as to leave too little time or strength for muscular exertion, or living so luxuriously as to be quite disinclined for either mental or physical toil. In these classes are the clerks of all grades, bankers, lawyers, clergymen, journalists, artists, musicians, students in their middle and latter years of school life, teachers, seamstresses, telegraph and telephone operators, and many others, besides the girls and ladies of wealth who live idly,—and all the more idly when boarding. The in-door workers and brain workers largely outnumber the out-door and muscular workers; and stand in great need of correct information on the uses of daily exercise, and the better modes and times for obtaining it.

The need of bodily exertion each day is an absolute one, and

inherent to every human being. It is based upon the physiological facts that the wasted elements of our tissues must be removed from the body, and be replaced by new elements prepared from the food; and these two great processes of life cannot be carried on properly without the help of some hearty muscular exertion.

Every tissue of the frame—muscle, tendon, bone, gland, heart, blood-vessel, nerve, brain—is an aggregation of minute cells. Each cell has its peculiar size, shape and arrangement, according to the structure and the portion of the structure it is in. And every structure is made up of different tissues, each tissue having its own kind of cells. Bones are chiefly earthy material; but at every point this material is joined and compounded with organized (living) gelatine and with minute blood-vessels. Muscles, besides their usual bundles of small red fibres, contain numerous blood-vessels and nerves, together with fat and tendon. Nerves and brain are of two classes of tissue, the grey nerve and the white nerve structure; and are well supplied with blood-vessels and accompanied by protecting sheaths of a very different tissue. The stomach has muscles, a lining (mucous) membrane, nerves of two kinds, large and small blood-vessels, and glands that secrete gastric juice and other fluids. The heart is chiefly muscular; but it also has a strong encasement tissue, and a delicate structure lining it within, and nerves, and its own series of blood-vessels distributed through it. And thus every part of the body has its peculiar combination of different kinds of tissue, its particular nerves in greater or less abundance, and blood-vessels, blood-vessels, blood-vessels everywhere.

The small or capillary (hair-like) blood-vessels are so numerous that we cannot prick the surface with the finest needle without wounding one and drawing blood. They are numbered by millions; and the total amount of blood in these is two hundred and forty times greater than the total amount in the heart, arteries and veins. In fact the heart and its large vessels are the conduits for carrying blood *to* these capillaries, and receiving blood *from* them. In and by the capillaries, with the millions of minute nerves that accompany them, all the functions of the body are made possible. All nutrition and all repair are carried on in the little cells by means of these capillaries. And by means of the immense number of these blood-vessels and nerves, every part of the frame is in sympathetic communication with all the other parts, and a detriment at one place is sure to be a cause of disturbance to other

:and remote places,—an inflamed bowel provoking general suffering and fever, and so small a thing as a felon upon the finger throwing the entire system in distress.

Every action of the living power upon and within the frame, uses up the nutrient elements in the cells. Every movement of the muscles, of the tendons, of the blood-vessels themselves, entails exhaustion of cells. Every functional act of stomach, liver, kidneys, bowels, nerve, and brain, entails a similar exhaustion. In every part of the body this process is constantly going on, and every vital action causes the exhaustion of the elements in many of these minute cells. And when the materials of the cells have been thus used, they have served their purposes in the life of the system, pass into the condition of death, are no longer usable, and must then be carried away and their places taken by new and living elements of nutrition. It is in this beautiful and delicate manner that all the operations of human life are carried on.

The process of separating and casting out the elements that have been wasted, is equally important with that of supplying new elements. If the wasted elements are not eliminated, they become foreign to the body, and soon manifest their presence by lowering the demand for fresh nutrient material. For hunger is nature's expression that cell material has been used up and removed, and that new material must be supplied; and if the old have been used but not cast off, the demand for new will at once be reduced and appetite will fail. And if the worn-out elements are not thoroughly eliminated, they will accumulate in the system as partially dead matter, oppressing every organ and tissue, tainting the minutest point in every tissue, poisoning the blood, and burdening the frame through all its parts. Well-balanced activity in using, removing, and replacing nutrient materials, expresses the healthy vigor of one's life.

The need of getting rid of those elements that have lived their brief life and died, is *imperative*. Their accumulation is not often rapid, because life would not continue many hours if their removal were stopped completely. All the secreting organs of the body—skin, liver, kidneys, bowels, lungs—are constantly at work casting out these waste particles and preventing their accumulation. So long as life exists, these organs keep at their work; and the *partial* failure therein of any one or more of them at once checks the process of removal, and the *total* cessation of any one of them would presently end in death. A man would

live but a short time if both his kidneys ceased to throw out urine. The liver is a sluggish organ, but a total suppression of its function would end in death in a moderate time. The result of completely stopping the secreting duty of the skin was illustrated in a great pageant in Italy, where a beautiful child was stripped of its clothing, covered with gold-leaf and carried aloft in the show. Perspiration was totally checked and the child died in a few hours. Animals covered with varnish will quickly die in the same way.

It is very seldom indeed that any secreting organ entirely ceases its function. But partial failures and obstructions are common,—so very common, that most of us lose sight of the importance to our healthful existence of this process of elimination. Its relation to the process of nutrition is as one end of a pair of scales to the other,—both are required to make a usable balance, and neither can be disturbed without at the same instant disturbing its associate. Waste must be ejected freely and steadily, or the entire processes of life will be interrupted or brought to a stop. When a boy, I lived for a few years on the north bank of the St. Lawrence. The British Government was sending to Canada great numbers of poor Irish, to save them from the potato famine then raging in that unhappy country. One morning I saw a boat-load of these emigrants trying to cook their breakfast on a little stove upon the deck. Each griddle-hole was occupied by the kettle of some one, and a huge Irish lad could find no place to set his kettle. Eyeing the little stove from various points, and not understanding the workings of an article that was wholly new to him, he was for a time bewildered. Suddenly a thought seemed to flash through his mind, he seized his little pot and placed it on the top of the short stove pipe that stood up in the air. The effect was alarming to him, the smoke streaming out on all sides. It required but a few minutes for the Irish boy and his company to realize that a fire must have a free escape for the smoke, as well as a good supply of air below it.

Muscular activity, in whatever form it may be used, is the principal means of promoting these tissue changes. By exertion, the size and firmness of the muscles themselves are improved, and their power is increased. As they everywhere impinge more or less directly and forcibly upon the secreting organs and all other structures of the body, they may be said to "squeeze" the waste atoms out of the substance of these organs. But the first great effect of muscular exertion is an increase of the rapidity of the

circulation,—both of the venous circulation that carries the blood and its load of waste-elements *to* the heart; and the arterial circulation that carries its precious freightage of nutrition *from* the heart to every tissue of the frame. So great is the influence of muscular action upon the activity of circulation, that the two are inseparable. The pulse is quicker when sitting than when we lie down, when standing than when sitting; increases still more on walking or working, and is farther accelerated by the speed of these actions. At the same time the breathing is hastened; the perspiration is increased, and becomes perceptible and more or less profuse; and the hurrying of venous blood through the liver and lungs increases the flow of bile and the ejection of carbonic acid gas; while the hastening of arterial blood through the kidneys and bowels augments the secretion of urine and excretion of alvine waste.

Those whose modes of life do not secure them a suitable amount of muscular exertion, thereby fail to maintain this great process of elimination; and the consequences are a slow but certain failure in the general vigor of body, various nervous derangements, and a gradual vitiation of the system that leaves such people in perpetual discomfort and establishes conditions that end in a needlessly early death. I am disposed to dwell upon this point; for the number of people who keep themselves half-way on the sick list, and who never know the exhilaration and luxury of feeling perfectly well, is very large.

Some pursue idleness from very love of it, which is a morbid state of mind that lowers their moral tone,—seen at one extreme of society in the degradation of tramps; seen at the other extreme in the uselessness of some wealthy ladies who serve no other purpose on earth than to foster class distinctions which humiliate honest toilers, and pet their own sons into drunkenness and debauchery, and their daughters into sensuous habits that often bring disgrace upon the family. The one class has become a nuisance and a danger in the land. The other class presents an example that is pernicious in their families and perverting to servants and others. There are wealthy ladies, however, who are always engaged actively in social and charitable undertakings, who obtain no adequate physical exercise. We can admire their sublime devotion to useful and kindly engagements, but they nevertheless suffer from deficiency of real muscular toil,—which is all the more requisite to them because of their elevated mental occupations.

Some persons are engaged in pursuits that engross their attention, and leave them little disposition to take necessary exercise; and these are often neglectful of this important requirement of hygiene. Professional men—lawyers, clergymen, teachers—are prominent in this class. Like students and artists, these men drift into a belief that they “haven’t time” to devote to exercise, considering that time so spent is lost to their calling. They forget, or else do not rightly understand, that muscular labor must *balance* mental labor, or there will be that inharmonious action between body and brain from which the mind is loser.

Mental action is the highest living function of which man is capable. It uses the most delicate, the most finely organized tissue in the whole animate creation,—the brain. This structure needs for its maintenance a supply of blood several times greater than any other structure of the same size; and it takes from that blood a class of materials requiring the most refined processes of vital elaboration. The expenditure of living force in supplying the brain with nutriment, and in removing the waste elements of its action, is much greater than in any other part of the body.

The brain has no secreting organ near at hand to eliminate waste elements; and can accomplish this only through the medium of a free circulation, by which the worn-out cell material is taken up in venous capillaries and carried to the remote secreting organs to be ejected. This circulation cannot be maintained except by the aid of muscular exercise; and the blood furnished to the brain cannot be pure without the help of exercise to keep the secreting organs active and to prevent the accumulation of waste matter in it; so that those who follow mental pursuits are in two-fold need of good muscular exertion to maintain the balance of supply and waste in the brain.

The effects of insufficient exertion in brain-workers are soon apparent in a feeling of deficient vigor and clearness of mind. Thought becomes more sluggish and common-place, their work diminishes in force and accuracy, they do not grasp their own ideas firmly and therefore do not impress them vividly upon others. No one realizes these facts more quickly than the brain-workers themselves, who are sensitive to the hazy atmosphere that dims their efforts without always being aware of the cause of it. Let such persons take brisk exercise for a reasonable time, and get their blood stirred up till free perspiration starts, and at once they feel that the mental cobwebs have been brushed away and they

return to their occupation with freshness and vim. Instead of it being time *wasted* in giving an hour or more each day to such exercise, it is time *gained* in the increased rapidity and clearness with which the mind can afterwards do its work. No time is so profitably spent by teachers, artists, editors, book-keepers, lawyers, clergymen, and all others in this large class of brain-workers, as when they firmly take a proper portion of each day in the vigorous use of their muscles.

It is related of the Rev. Lyman Beecher that he would sometimes find himself sluggish and miserable for lack of exercise; and there would come over him those feelings of gloom and discouragement and melancholy which are inevitable to the mental laborer who does not get sufficient use of his muscles. Realizing the cause of his despondency and inefficiency, he would rush off to the wood-shed and ply the saw till fairly tired; and when his own wood-pile was finished, he would shoulder his saw and go to a neighbor's and work there for an hour or more. Such a man could put into his sermons and essays the force and glow stirred up in his own body by such exercise; and when other clergymen find themselves becoming feeble in their calling, and failing to impress themselves upon their hearers, they would do well to study the example of the sturdy New England divine and put fire into their work by taking some vigorous exertion. He was a wise jurist who bought a farm and labored on it himself a few hours every day; for he kept his brain supplied with pure blood, thus securing a clearness of mental action that made his opinions sound and gave them the highest value among men.

Some persons are circumstanced so that very little time is left to them for exercise, following in-door employments that are at once wearying and enfeebling. Among these are clerks, jewelers, engravers, watchmakers, seamstresses, and many others. Such persons are in danger from the poor air, lack of sunshine, cramped position, and the other adverse surroundings of their occupation, (p. 120). They lose ground physically and mentally, and at the close of each day are too nerve-weary for much exertion. But no persons need the blood-purifying and the nerve-toning influence of muscular exercise more than they; and if they do not obtain it in some form, they will inevitably droop and fade and die prematurely. It is almost hopeless to advise large numbers in this class, for they are too often driven to the verge of exhaustion to earn their scanty living. Heaven help the oppressed poor against

whom the greed of man seems to have closed all avenues of sympathy.

But many in this class could, with proper forethought, manage to obtain suitable physical exercise and thereby sustain themselves in a fairly vigorous condition. It depends largely upon their own judgment and pluck. By their very occupation, they are made lax in muscular fibre and disinclined to exertion; while the jaded nervous system gives a lack of desire for physical effort, and inclines them to seek recreation at theatres, assembly-rooms, clubs, and similar exciting entertainments. Such forms of spicing their monotonous life give a small measure of relief by furnishing variety; but they at the last place another tax upon the nervous system,—different from that of their occupation, but nevertheless a *tax*,—and do not in any way refresh or recuperate the wearied frame. And the surroundings incident to such places of entertainment too often tempt to the use of some false stimulant to prod the jaded nerves, and so lead to the formation of vicious habits.

What this class needs, is some decided muscular exertion. It may be troublesome to arrange it, but it can usually be done by judiciously determining that it shall be done. The tired feeling at the end of a day's work is an oppression; but after a brief rest, let the muscles be brought into brisk action by a lively walk, the use of dumb-bells or Indian clubs, a little trapeze or other light gymnastic exercise, and the whole body will really be refreshed by this diversion of action away from the nervous structures to the muscles. For it is a law engrrafted upon the human frame, that when parts of the body are used unevenly,—one being wearied with over-work while the other does not have work enough,—balance is restored by any change of action that rests the former and for a time brings the latter into exercise. By such change of action, the balance restored brings relief and freshening to the jaded structures; and in this way one can compensate for a lack of muscular activity in his daily occupation, and maintain a healthy life where others break down.

Peter Henderson, in one of his excellent works on gardening, illustrates this subject nicely. A book-keeper of his acquaintance was pale, thin, dyspeptic, sleepless, melancholy, and “nervous” from the confinement incident to his calling and from insufficient muscular labor. He was a perpetual sufferer, pretty much broken down in health, and feeling life to be a great burden. Mr. Henderson advised him to live out of the city, to get a village home

with a garden-lot attached to it, and to dig up and cultivate that garden with his own hands in early morning and late evening. The advice was taken, and instructions for managing the garden were given. The pale, thin man went to work determinedly and continued it faithfully. It was for a long while burdensome to him, and often-times he was tempted to give it up as many will do; but finally his growing radishes, beets, cucumbers, corn, and other vegetables, became objects of pride, and he continued the work in his little garden bravely. His city occupation lost its burdens and its impress of monotonous drudgery. He could keep up his books more easily than before. And ere the summer was over he had a good appetite, his dyspeptic torments had disappeared, rich blood helped to make his cheeks ruddy, his nerves were steady as iron, he slept soundly, and was a lively and a vigorous man.

The *kind* of exercise that one takes will be determined by a variety of considerations. Two facts or rules are always to be obeyed:

1st.—The exercise is to be taken *every day*. It is of little use to plunge into violent exertion for a day or two, and then take none for several days. Such a course cannot satisfy the muscular needs of the system; and fitful exertions are liable to be made extreme, thus doing harm rather than good. A course of this character would lack system. It would be too much like the Irishman who stuffed his pig one day with all the food it could possibly eat, and the next day left it squealing with hunger. He explained his absurdity in feeding by saying he liked his pork with a streak of fat and a streak of lean. The system requires food each and every day, and demands some scheme of regularity in the time and amounts of eating; and so does it need a proper amount of exercise each and every day, with no days of total idleness between except under absolute compulsion.

2d.—So far as possible, exercise must be taken *out-of-doors*. Half an hour, suitably used in the open air, is more valuable than an hour in-doors with the best means ever invented. Weather and other circumstances may at times prevent getting abroad, especially with the young and the invalided; though pretty rough weather need not be feared by those who are physically able to go out, for by clothing and by the exhilaration of the exercise itself they can protect themselves. But the purpose should always be, to get a large share of exercise in the open air during the hours of

sunlight; to make this the more absolute when one's calling is sedentary: and fairly to live out-of-doors as much as possible when the general strength has been reduced, and the lungs and nervous system are feeble. When the out-door exercise cannot be made sufficient, then in-door measures must be provided.

The age of the person will help to determine the kind of exercise taken. Children, during their school-life, usually get a fair share of it in walking to and from school, with the games and romping that young folks commonly indulge in so heartily. Such pastimes should be encouraged to a suitable degree, in which respect our English ancestors and cousins have set us a good example. In large cities, the moneyed value of land has sometimes led to the provision of school-grounds too small for the number of children in a school. This is unwise economy; and it is gratifying to notice a decided inclination, of late, to furnish ample space for the children.

School exercise for boys is generally secured, but girls frequently do not get enough of it to make them hearty and vigorous through their growing term. During their younger years, they may have all the running, rope-skipping and other exertions necessary; but later on they come under the restraints of prudence and fashion, and are deprived to a very large extent of the muscular exertion they require for the development of hearty womanhood. Romping is considered unlady-like, natural joyousness is repressed, a monotonous walk takes the place of vigorous play, and the crowding studies weary the brain and nerves. Such a course prevents the proper consolidation and balancing of the body, enfeebles the muscular and bony structures, and increases that morbid "nervousness" which in later years makes so grievous a burden in the life of many women. Happily, a change in these matters has gradually taken place in many sections, and girls and young women take more part than formerly in such out-door games as croquet and lawn-tennis. I am confident of noting a decided improvement in the stature and vigor of the young women in many places, as a result of such lively exercise; and if there shall be fostered a general resort to such muscular exertions among girls, another generation will give America the most magnificent women and mothers of the world.

There lies before me a paper with a brief article bearing upon this question from another stand-point, which is so good as to deserve quoting:

"A school-girl misses a great deal of valuable education who hurries away to school, morning and afternoon, without having used her muscles in helping her mother. She misses something else which, in a few years, she will know how to value better than she does now,—grace of movement and carriage. What makes a girl graceful? It is using all her bodily powers. A student who is nothing but a student, soon begins to stoop; and the habit, once begun, is inveterate and incurable. Half our school-girls cannot walk with ease and grace. We see this very plainly on Commencement Days, when the members of the graduating class are obliged to walk a few steps before the audience. Their dresses are often too costly and splendid, their hair is beautifully arranged, their pieces are creditably written, one thing only they lack,—they cannot walk. A girl who would have a graceful carriage, a sound digestion, a clear complexion and sound teeth, must work for them every day; and no work is better for the purpose than the ordinary work of a house, done with diligence and carefulness."—(*Youth's Companion.*)

It is an inestimable blessing to many women that they have a portion of household labors to perform each day. It is a sad loss to many others that, boarding in hotels or elsewhere, they have no household duties and get too much engrossed in frivolities to take any out-door exercise. However well provided with "help," a woman will find much in her own home that should be done with her own hands, and if she will do a share of this muscular work vigorously, she will reap its benefits in body and mind.

Among out-door exertions, *walking* is one of the best. It should be done with sufficient briskness to stir the blood up, for mere lolling on a promenade of display is of small value. One advantage gained by those who visit mountain resorts, is the opportunity there furnished for attractive walks that demand a goodly outlay of muscle. Rambles among the hills expand the lungs and enrich the blood, and bring vigor to the whole body. Persons who sit much during the day have especial need of walking, to call into use the muscles of the back and the lower extremities; but those who are much upon their feet need a different kind of exercise. Ladies of wealth ride too much in their carriages, which is a good way to get an "airing," but does the muscular system very little service. If such ladies would walk two or three miles every day, and do it right heartily, many of their feelings of malaise would soon disappear, and life would be vastly more enjoyable.

Horse-back riding is a good and gentle exercise for those who can obtain it. It calls the spinal muscles into full use, helps to develop the chest, and imparts a fair motion to all the viscera. It has the advantage of not being fatiguing even when prolonged. English and Southern ladies resort to it commonly, and it aids in giving them a full chest and graceful carriage. Northern ladies would do well to imitate them, and so would gentlemen. Children of both sexes, when trained early to riding little ponies, derive great physical benefit as well as pleasure from this pastime.

Students at college should have a large share of exercise, if they want to keep in good health and make sound progress in their studies. They generally resort to *athletic sports*, in which they should be encouraged by their Faculty. Such sports can be quite overdone,—can be carried to excess as to amount, severity, and the spirit of betting too often associated with them. Such excesses are greatly to be regretted, but they do not form a rational part of the sports themselves. When a Faculty coarsely discountenances all college athletics, because of those abuses, it loses the power of kindly guiding the young men to a proper use of their games and of leading them to employ their strength in a manly way. I feel a sympathetic enthusiasm in honorable games of ball, running, leaping, rowing, and other athletic struggles among young men; and when these friendly contests are tempered with moderation and ruled by a spirit of manliness, I know that the students will be all the better students for their vigorous sports, and all the better prepared for the duties of life.

Gymnastic exercises are sometimes the best that city clerks and business men can obtain. In the absence of anything better, they should by all means be used. They have the disadvantage of being in-doors, sometimes in rooms over-heated, ill-ventilated and dusty. But, on the other hand, they have the advantage of being adapted to any set of muscles that especially need strengthening, or of all the muscles when desirable; and, when not indulged immoderately, they are invaluable to a large number of men (and of women also) who cannot possibly secure any other mode of muscular exertion. The use of Indian clubs and dumb-bells is a fine part of home gymnastics, desirable for expanding the chest and strengthening the upper spine. A home trapeze, made simply of a stick through loops in two ropes suspended from the ceiling, is of great value to persons of narrow chests and drooping shoulders. These are among the “light gymnastics,” and other forms

will readily suggest themselves; and such light home exercises can be used for a few minutes at a time several times a day, thus often having a decided advantage over heavier exercises at a gymnasium. Supplemented by half an hour or more of brisk walking to strengthen the lower spine and limbs, they constitute a good form of exercise.

It is not advisable to take severe exercise too near a meal, either before or after it. The stomach needs a full flow of blood towards it for digestion; and heavy exercise about the time of taking food will divert too much blood away from the stomach, besides fatiguing the nervous system just when the digestive function needs it to be vigorous (p. 138). Even strong and healthy people who labor, find it advisable to get a period of rest before and after eating. Those needing exercise for health's sake, will find it quite unprofitable to take much of it before breakfast; and those who imagine they can benefit themselves by a long and rapid walk, or a violent half hour at heavy gymnastics, before the morning meal, make a mistake. A short and gentle walk, a few minutes at light gymnastics, or some other form of moderate exertion, is generally advisable; and those who most need exercise will usually find it desirable to take some limited portion of it before eating in the morning. By this they secure just enough stimulation to put their blood in motion, and to get an appetite by starting the elimination of waste materials (p. 165). But feeble and elderly persons may not be able to do even this, and require some nourishment before using their muscles; and many thin people advancing through middle life, though not on the list of invalids, may find it necessary to take a glass of milk or broth or some other light food before leaving the bed, to save them from a feeling of "sinking" that comes over them on rising. Nutrition is not active with such people, and requires a supply of food even before they make the small exertion of dressing.

The *amount* of exercise that a person needs, depends upon his condition. It should not be so great as to make waste exceed nutrition (p. 167). The largest benefit is obtained from manual labor and from other muscular exertion, when they stop short of exhausting nutritive supply. A surplus is then left for the body to draw upon, and a reserve for any emergency that may arise. When the exertion is so great or so prolonged as to make a draft upon the nutritive supply, a loss of strength is sustained and the body suffers. All forms of exercise should be discontinued be-

fore they endanger a sense of fatigue or exhaustion, for when this feeling ensues the muscular effort has been too great in either its violence or its duration. A pretty good general rule is, for thin people to employ exercise till they find themselves in a pleasant glow; and for fleshy people to bring themselves into a perspiration.

Walking, rowing, gymnastics, and other forms of exertion may thus be carried to such extremes of violence as to do injury instead of good, and to damage the very persons who need to be strengthened by them. Young folks, in whom the nutritive processes are generally carried on with great activity, can take a great amount of exercise; and so can those at any period of life who are accustomed to exertion, if their bodily powers are not at the time reduced. But the feeble and the aged must exercise with cautious limitation; and those whose muscles are soft and unaccustomed to sharp use, must resort to any form of exercise with great moderation. Such persons can easily put upon themselves a taxation that would be of long-continued disadvantage. They should begin their muscular efforts as gently as if they were children; the enfeebled must exercise very lightly. Many invalids, especially ladies, are so reduced in muscular tone as to be for the time as incapable of firm effort as if they were babes. Such persons may have to take exercise by proxy until their muscles have the waste elements removed and a good nutritive supply set up; *i. e.*, they must have their muscles squeezed and rolled by the hands of another person in that excellent process called *massage*.

Students sometimes start enthusiastically upon a course of exercise that would do well enough for an athlete, but is entirely too severe for their lax tissues. Fatigue and injury are sure to result. This is especially liable to occur in the use of the heavier gymnastics. Hard running is very taxing to the heart and lungs of boys, whose fibres are not yet solidified and hardened; and sometimes they suffer overstrain of these organs, from which they recover only through years of caution, or possibly never recover entirely. Slender children may play too hard, and exhaust themselves at their simple pastimes,—remaining thin and pale, and complaining much of feeling tired. Parents have to watch such children and moderate their play, and insist upon their taking a period of quiet rest every day (p. 114). Some energetic women of slight frame have much more ambition than strength, and would entirely overwork themselves if not held in check by husband or other member of the family. Ambitious lads on farms

are oftentimes prodded by vigorous men, and led to struggle to keep up with a strong man's task in labor; the result being a great excess of waste over nutrition, with a lean frame prematurely stunted in its growth. Yet the out-door life on farms may counter-balance these physical strains; but when such over-work is forced upon children and youth under the disadvantages of close air and over-crowding in factories, the results are exceedingly damaging.

The value of any exercise is materially enhanced by cheerfulness, for a pleasant frame of mind is itself a good promoter of health. Exercise undertaken in a gloomy spirit, and carried on in a mechanical and perfunctory manner, blunts the zest that should season it and dampens the ardor it should create. An occupation (p. 122) that is monotonous, that does not elicit intelligent study and reflection, may make hardy muscles or expert fingers; but it fails to develop the activities of the brain, and therefore dwarfs and imparts dullness to the mind. So, likewise, a system of exercise pursued for the mere purpose of obtaining muscular exertion as a sheer duty, becomes burdensome and monotonous; fails to clear the cobwebs from the brain and secures but half the advantages that would follow if the mind co-operated heartily with the exhilarating efforts of the body.

CHAPTER XXI.

REST. OVERWORK. SLEEP.

DAILY exercise, as has been shown in the previous chapter, is needful to health. It is a requisite to good digestion, sound sleep, clear thought, and power of endurance. Many a dyspeptic groans over his food, and mopes over his distresses, who may have nothing but his own indolence to blame. Many a poor sleeper lies tossing on his bed most of the night, and wakes unrefreshed in the morning, whose chief trouble springs from want of good muscular exertion. Not that all such conditions are caused by idleness, but only that very many of them are; and it would be a thousand-fold better and more effective if these afflicted ones obeyed the laws of hygiene, and daily took a full portion of work instead of relying upon a round of medicines.

But every portion of the body must have a proper period of
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rest, otherwise its activity will be in excess of nutrition (p. 175) and its exhaustion will follow. The muscles and the brain are included in this general rule; and the rule may be enlarged by the statement that those organs whose action is most intense, require the largest amount of rest,—a corollary that applies especially to brain-work. The period of rest is the time of repair, during which the exhausted cell elements (p. 165) are replaced most fully; and if no adequate repose is allowed between the times of exertion, the repair will not be full and perfect.

Every organ of the body that is not under the control of the will, is constituted so as to have natural periods of rest. The stomach does not keep in action all the time; but secretes its gastric and other juices at stated intervals and then rests (p. 136). The lungs do not breathe continuously, but the muscles that move them get a brief respite from action between each inspiration and expiration. The heart itself, though apparently in perpetual motion, enjoys a momentary lull between each and every beat. The latest and most accurate investigations upon the action of the heart, prove that this wonderful organ is actually at rest from all motion about one-third of the time. No fact could more forcibly emphasize the vital need of rest to every fibre in our bodies.

Large numbers of people, in these days of hurry and push, continuously over-do themselves. The struggle for existence and the support of a family with some, and the haste to secure a competence and then to amass a fortune with others, lead to such years of systematic over-work as frequently to wreck the brain prematurely. From childhood onward, the strained expenditure of energy is too great with many. Children are sent to school too soon, and then forced through a course of studies entirely too great for the majority. Laborers, mechanics, artisans, are either too poorly paid, or else spend too much of their earnings in drink, to sustain families without too much strain at hard toil. Farmers, teachers, business men, all contain large numbers in their ranks who are continuously using up life by overstrain of either muscles or nerves. Our very pastimes are done with a rush that wearies rather than refreshes,—a picnic, a game of lawn-tennis, a turn with a skating party, being carried out so “fast and furious” as to send everyone to the house “tired to death,” as the ladies commonly express it.

The Vital Force whose labors constitute existence (p. 10), has two purposes to accomplish in order to maintain this existence in

a healthy state. It has to remove waste material and keep up the supply of nutriment, as explained in the chapter on exercise. It has also to hold in every tissue of the body a surplus of nutriment, that represents a reserve of vitality upon which drafts may be made in case of sickness, of accident, and of other emergency. Such reserve force exists in the muscles and brain and all other tissues of a thoroughly healthy person; and when the occasion for its use comes, and large drafts upon it are made under compulsion, each part yields a share to the sustentation of that part which especially needs it. If the amount in reserve is considerable, that man will be likely to pass through severe ordeals with safety (p. 12). If the reserve stock is small, even a moderate struggle against calamity exhausts the little that is held; just as a man with but a few dollars in bank, and no other resources to draw upon, cannot sustain a turn of bad fortune that requires a large outlay. This man may struggle earnestly to pass the turn safely, but is pretty sure to come out financially bankrupted. The other man, who has squandered his reserve vitality as he went along, is pretty certain to come out of a struggle against disease physiologically bankrupted.

He who persistently *overworks* a part of the body, uses up its reserve strength and makes its sudden failure or total wreckage possible. Be the overworked part stomach, liver, bowel, kidney, eye, or muscle, the consequences are the same,—weariness, exhaustion, damage. Where the amount of waste greatly over-tops the capability of supplying nutrition, the vital tone is reduced below the normal standard; the waste elements themselves cannot be removed as rapidly as the exertion makes them, and so accumulate in the parts; and the nerve-tracks supplying the overtaxed part become fatigued and can no longer furnish the vital stimulus necessary to action. And these propositions are as true of mental overwork as of muscular; for the brain tissue that is engaged in mental processes is itself dependent on other nerve structures within the cranium, and which constitute the larger portion of the brain and the very citadel of life. Mental excesses drain this great centre of supply more seriously than do excesses by the stomach, muscles, or any other part whatever; and exhaustion brought to this stronghold of our existence by mental overwork, is more disastrous than fatigue of any mere portion or line of nerves emanating from it to muscle or gland, and is much more difficult of repair.

Muscular Exhaustion.—In our country, we do not see the effects of muscular overwork so conspicuously as is seen in England and other parts of Europe. Here the general laborer gets a rate of pay that enables him to live comfortably without exhaustive strain; while there the wages are so low, and the labors so severe and prolonged, and the need of growing boys and girls being put to work is so imperious, that the results of such taxation are very common.

The general effect of muscular overwork is stunting or dwarfing of the growth. Dr. J. Fothergill tersely remarks on this point: "All observers must have noticed that in our busy manufacturing districts there is a marked tendency in the working population to be short,—stunted is the more correct term. Not only so, but there are a large number of persons who depart still further from the norm, and are more or less deformed. Those modifications of the human frame are the results of early toil. When children are condemned to long hours of toil in the factory and the mine, the effects upon the physique are marked and unmistakable. When toil is combined with in-door occupation, or, to put it more correctly, is divorced from pure air and unlimited supplies of oxygen, then imperfect development and disease are engendered."

Even in agricultural populations, where out-door occupation supplies abundant air, and oxygen can be stored up (p. 46) for the uses of the body, the exhaustion of prolonged toil is still apparent. Ambitious boys may thus be stunted; or, if not dwarfed in body, are day by day so fatigued by their too heavy labors as to exhaust the vital nerve supply, and have none left to feed the mind. They do not get enough rest and recreation to freshen them and maintain a normal balance throughout the body. In too many instances do we see it verified, even among prosperous American farmers, that "all work and no play makes Jack a *dull boy*." By this extreme in one direction many times comes a loathing of an occupation that offers nothing but incessant toil without mental gratification or growth; which causes many young men to leave the farm for town or city, there to eke out a precarious living, or to drift into idleness that is akin to vice.

The ill-effects of muscular overwork are often seen upon particular sets of muscles. It brings to these a sense of fatigue that makes further exertion unpleasant, or an actual pain. Boys throwing stones too long, or skating too long and hard, are familiar with the muscular soreness and aching that follow these exertions.

Carried farther, the muscles tremble and even suffer cramps, and in severe cases may pass into spasms. Instances are not uncommon where ambitious girls, seeking to outdo some playmate, have continued jumping the rope till exhausted, and then have suffered prolonged jerking spasms to an alarming extent, and have at times died from these.

In some occupations, where the exertion is confined to a small group of muscles, similar evidences of exhaustion are first noticed; and finally, under a continuation of the employment, those muscles may pass into a condition of chronic prostration, then into a degenerative condition, and perhaps finally become palsied and withered. In this class is the "writer's cramp" that afflicts some who write steadily for many consecutive hours,—the muscles thus employed in the fingers and forearm becoming painfully cramped till it is impossible to hold a pen until a suitable period of rest has made restitution of the exhausted strength. Tailors sometimes have a similar cramp. Pianists frequently suffer it, especially young persons who are compelled to sit upon the music stool and "practice" several hours a day, till their fingers tremble, and the muscles of the spine weaken from the overstrain and perhaps end in deformity.

Clerks in stores present curious examples of such exhaustion. Onimus relates an instance where a man's entire business was to replace unfolded goods, calling into action certain muscles of the shoulders; and after a time these overused muscles lost power and became wasted. In some stores there appears to be no humanity in the employers and overseers, but they compel young women in their employ to be continually on their feet even when not waiting upon customers. From morning until night, these sales-women get not one moment's rest to the muscles of their limbs. They go to their humble homes aching with weariness; and very many of them soon become exhausted and broken down under the strain. It is a refinement in cruelty that shoppers could quickly force storekeepers to bring to an end.

Onimus gives the case of a tanner. "He was every day for eleven hours at work, and always felt aching and fatigued after his day's labor. There supervened marked muscular atrophy [wasting] confined to certain muscles. In order to prepare the skins he had to perform, with both arms, a forward and backward movement, which necessitated especially the action of the muscles of the shoulders, so that these were the first to be affected. The

wasting away is almost the same in both arms, as both were in action during the man's work; whereas, in respect to the legs, the right one alone was obliged to support the whole weight of the body, and this is the only one that has wasted. It is one-half smaller than the other, and the affected muscles are those the action of which was the most constant."

Among the callings that give rise to muscular deterioration are those which include the prolonged use of the hammer, such as file-making, knife-blade-making, scissor-making, etc. The rapidity and steadiness with which a hammer of no small weight is lifted by a workman in these trades, is somewhat surprising. Dr. F. Smith carefully estimates that a maker of pen-knife blades will, in the course of a day, make 28,800 strokes with a hammer weighing three pounds. That means a heavy daily expenditure of nerve and muscular force by certain groups of muscles. Such trades are gradually exhaustive, the overstrain of the muscles being also associated with indoor life, a cramped position, and the lack of that use of the other muscles which is in itself a relief and a recreation. When the waste of such exertion begins to exceed the nutrition, the large, firm muscles of the arm lose strength, lose the necessary accuracy of stroke, become somewhat palsied, and then begin to waste. Meantime this quite local overtax has been a persistent strain upon the heart; and finally this muscular organ and its large vessels give way before the stress, and "heart disease" is suddenly and fatally developed. Such a termination among file-makers is common; and is a source of surprise to the bereaved family who have not thought of or understood the local overtax under which the artisan labored for years. But enlargement and other troubles of the heart from overstrain are more common among miners, coal-heavers, porters, and others compelled to lift heavy weights; also in soldiers after forced marches, in athletes, etc. All such facts show the need of care that a disabling extreme of exertion shall be avoided.

Nervous and Mental Overwork.—The most common form of exhaustion in our country is that which comes through mental and nervous taxation. As a people, we live too fast, put on too much steam, rush and drive too rapidly, expend too much energy in everything we do, seek to accomplish too much in too little time, use up life too freely in endeavors to outdo all our neighbors. As a result, we find too many nerve-weary people on every hand, too many used-up and prematurely broken constitutions.

And with these modes of life come the added facts of mental anxiety and worriment incident to a limited capital, to a large business, to financial or social disappointments, and to many other trials,—common enough in most lives, but making a heavy drain upon the nervous system. The mind is capable of doing a vast amount of work, and the extent of the mental strain and study that many vigorous men endure is really astonishing. But mental exhaustion and nervous exhaustion are prostrating to an extreme degree, even when all the surroundings are good; and when the surroundings are unfavorable,—when the physical exercise is too little, or the air in office or home is impure, or anxiety is a pretty constant companion, or sorrow is a daily attendant,—then an exhaustion of the nervous system is a grave matter, and at all times is slowly recovered from. Prolonged mental efforts and anxieties make a drain upon life that is far in excess of that made by any corresponding degree of muscular effort; and although this drain is hidden somewhat in its advances, not always being recognized early, it is all the more alarming because of this insidious growth.

Chief among the sufferers from mental overwork are students,—the young of the land, ambitiously striving to obtain an education. For them is prepared a course of study that is entirely too burdensome for the majority. The studies are at every stage too numerous, mostly far in advance of the student's years, with daily tasks too extensive for reasonable acquirement. Scholars ripe in years dictate for the young lessons better fitted for themselves. School Boards, often made up of ignorant men or saloonists, establish a course of study drawn up by a committee that too often imagines an education consists in the greatest possible amount of cramming,—as if the mind was to be filled by forcible stuffing, as one fills a sausage. Teachers must force the pupils up to these requirements, or lose their positions. Pupils must work up to them, or lose their grade on some trifling question—or by the “marking” of some teacher prejudiced against them. Examined in detail, and the boasted public-school system of many States is a monstrosity and a barbarism, so far as concerns its adaptation to the physical and mental health of the pupils. And colleges are so far imitating this high-pressure system, that many of them shape, for young men of twenty to twenty-five, a curriculum that should have a life-time for one to learn and understand properly.

Robust youth, and some who have the rare ability of learning very rapidly, pass through such a laborious system of education

without much detriment. But many children, and young men and women, have not the treasure of a robust constitution, or acquire their daily tasks only by tedious and protracted effort. To them the duties of school-life soon become repulsive; and they either insist on leaving the school-room before acquiring a reasonable education, or pass through the course in mental torture and come out of it greatly reduced in health. How many graduates of high-schools close their studies pale, wan, nervous, dyspeptic, anaemic, as the results of their over-strain in study,—requiring years to regain their natural tone, even if they ever succeed in making restitution of the vigor of the body and mind that was exhausted in school. Many a promising young man and woman, from whom a brilliant future was expected and whom proud parents stimulated to precocious attainment, have totally exhausted their brain-power in over-study, and at the close of their school career have been found to retain but mediocre capacity.

Every intelligent farmer knows that a young horse over-worked grows into an animal of reduced value. It would be a blessing if parents and teachers and school trustees could be made to understand with clearness that a young man or woman over-taxed at school, may for years after, or possibly for the remainder of life, be comparatively feeble and common-place in all forms of intellectual pursuits. A due appreciation of these facts would lead to the adoption of courses of study that would be within the reasonable acquirement of the *many*; rather than such as could be compassed only by the brilliant *few*, and at the risk of ruining the health of even these. As a result, we would be a better, because a sounder, educated people than we now are,—less surface smattering, that is in keeping with a nerve-tired body, and more profound intelligence suited to men and women of power. We would also have but few young people coming out of school and college to enter upon the active labors of life, with body and brain exhausted and unfitted for duty as they touch life's threshold.

But business men and their clerks are also great sufferers from this mental overstrain. Too much responsibility is assumed by the employers; too many brain-burdens are included in the duties thrust upon active book-beepers, cashiers and other employees. With in-door pursuits taxing them to the utmost, little pure air and less sunlight to invigorate them and keep the blood rich, and little time and less inclination to take suitable out-door exercise, the strength must fail sooner or later. How common it is to see

business men break down in middle life, and become physical wrecks long before the real vigor of manhood should have passed. How many men of large capacity and uncommon breadth suddenly are found making great errors in their affairs, failing to hold with their usual firmness the entangled threads of their enterprises, losing opportunities or taking false steps through a strange indecision that is new to them, and falling into bankruptcy like a flash and to the surprise of everybody. They had over-taxed themselves, had wearied their brain, had exhausted the very fibres that give clearness to business thoughts, had reduced their power of strong mental action without themselves being aware of it, and fell with a crash into financial bankruptcy because of having first driven the brain to the verge of intellectual bankruptcy.

A successful business man, by his energy and breadth commands the respect, and then the confidence, of his fellow man. As his capital and experience increase, they engage him in new enterprises, and place much or most of the general management of these upon him. He becomes a director in this bank, and that insurance company, and the other railroad interest, perhaps the president in one or more of the corporations, besides managing his own proper business and being a guide in various church and social matters. He is consulted by all, duties are heaped upon him till they become like mountains. Every waking hour he is pressed with the cares of these multiplied connections, and usually carries many of them with him far into the night. For a time his well-toned brain and cool self-command bear the load with apparent ease. But by and by it becomes onerous. He begins to want more stimulus in his food, or to crave some alcoholic stimulus, to sustain the sense of fatigue that creeps over him at times. His appetite gets precarious; digestion is disturbed, or becomes absolutely troublesome; he does not get to sleep so promptly as before, and presently begins to lose considerable sleep and to rise late and unrefreshed.

This man is now brain-weary. He may not realize it, his friends may not realize it, but such feelings under such circumstances tell in unmistakable language that his brain is over-taxed and is getting exhausted. If he refuse to realize his true situation, refuse to heed the advice of his physician and family who do realize it, a continuance under such prolonged mental strain will lead to financial if not to mental disaster. Outraged nature will turn upon him. His weary brain will grow timid from weariness, and

mistakes will be made. His "operations" are large, and a single mistake may topple over every grand structure he has been erecting so laboriously. Scores, hundreds, perhaps thousands, go down as he goes down. His family and friends suffer many sorrows in consequence of his failure. On-lookers have no sympathy with him, if he has been tempted outside of the paths of legitimate business; but are grieved and astounded if he has failed in honorable pursuits. So sudden a failure cannot be accounted for. The medical man is not surprised, for a brain over-taxed by so many enterprises must inevitably give way and ruin in some form follow. Lucky is that man if his very mind does not go down in the wreck, at least so far as never after to recover its wonted elasticity.

Such histories are common, entirely too common, among the business men of America. They begin usually between the ages of twenty-eight and thirty-five, when the energies and ambitions of capable men prompt them to great efforts. They commonly terminate between the ages of forty-eight and fifty-five, just when the mind should be ripest and most capable of grasping large business problems. The defection of others, to whom much of these varied concerns must necessarily be left, often plays a part in these sudden failures. But the prime factor in them all is likely at the last to be brain-weariness, due to long-continued pressure and exertion with no adequate allowance of time for rest and recreation. An exhausted brain can no more work actively and decide with unerring clearness, than a school-boy's arm exhausted by prolonged throwing can continue to throw forcibly and with accurate aim. There must always be rest sufficient for full nutrition, and exertion must always and in every case be limited to the nutrient resources of the system. No man, in body or brain, can violate this simple rule with impunity; for Nature will first demur and then revolt, and some form of bankruptcy must then be expected.

Sleep.—During sleep most of the nutrient repair of the nervous system is effected. So long as one is awake, the mind must be in action, and opportunity for nerve repair is limited. When mental or physical exertion does not exceed the power of nutrition, they promote sound and healthy sleep, and one feels refreshed and re-invigorated on awaking. When the sleep begins to be disturbed, and there are dreams and nightmares, or it ceases to be properly refreshing, something is wrong; and it is important to ascertain if that wrong does not lie at the door of too much muscular exertion or too severe brain taxation. Children at school

are often restless from such causes; and adults are sometimes also restless from over-work as well as from too little work (p. 170). Long hours of wakefulness much more commonly proceed from brain-weariness, with or without anxiety, than from any other cause.

The amount of sleep that one should have, depends on a large variety of circumstances. A German schedule for the ages up to fifteen years was given on page 114. As there stated, American children usually require more than the table suggests; for very active and nervous temperaments expend more vital energy than slower temperaments, and therefore require more hours of rest for recuperation of the nervous system.

Most adults above thirty require, in this country, fully seven hours of sleep. Brain-workers should get eight hours, and nine hours may be none too many. This will be a good rule to go by, even though there are distinct individual exceptions. Some persons lead an active life and find themselves doing perfectly well on six, or even five hours of sleep. They sleep very soundly, and awaken perfectly refreshed. But such persons are decided exceptions among men, and are not to be accepted as a rule for others. Women require rather more sleep than men; and slender women should always, if possible, have a brief sleep during the day,—or at least a half hour or hour of quiet rest, to relieve and soothe the nervous system and the muscles. Many a weary mother requires such a period of quietude, even without actual sleep, during the day, even though she may insist that it is not needed and that she can not get time to take it.

CHAPTER XXII.

HYGIENE OF THE SCHOOL-ROOM.

No place is more deserving of careful hygienic attention than the school-house and the school-room. The young and the susceptible are gathered there, and need the best care to guard them against damage to body or brain, and preserve them in good health while obtaining an education. The dangers to which they are subjected from over-study, were briefly spoken of in the last chapter. I wish here to call attention to some other hygienic

points that should be considered in this connection, and then revert to the question of study.

School-Houses.—A school-house should be in a position that will admit sunlight to every room a portion of the day. A supply of sunlight (p. 30) is nowhere more important than among the children, and nothing should be allowed to obstruct its full entrance. It is unfortunate that many large schools in great cities do not provide sufficiently for this. Either the windows are too few or they are badly situated; and sometimes adjacent buildings are near enough to cast their shadow upon lower rooms that otherwise would admit the sun. A position, in cities, where some of the walls run east and west, cannot provide sufficient sun to rooms receiving their light from northern windows alone. In such a situation the north rooms should be arranged to secure some light from windows opening to the east or west. If such a building could be situated so as to have its four corners directed to the four points of the compass, the question of full sunlight into every room would be solved. This is rarely possible. A position at the corner of two streets offers many advantages for the purposes of light and air.

No school-room should ever be underground, or even partially so; for such a room is totally unfit for any living being (p. 21), and upon children the effect is most disastrous. Nor should a school-building be too high, not more than three stories, for it is fatiguing for girls to climb many pairs of stairs. On this account the ceilings should not be too high, although for the sake of ventilation there should be a goodly height to the rooms.

Ample play-grounds should be provided to every school, that children may have plenty of romping room (p. 172). To possess "a sound mind in a sound body," is a first requisite in obtaining a good education, and in securing the subsequent advantages in life to which an education is a stepping-stone. A sound body cannot be preserved where school-children have no adequate grounds for playing, or where they are rigidly restricted in the use of such grounds when the public provides them. A school-boy or girl playing in a hampered manner on the sidewalk, or in a dull side-yard, or in a cellar under the school-house, is an object of pity. Give the boys and girls abundant room for play during the years when their hearts are light and play is part of their being. Encourage them to use the grounds in vigorous sports, and not after a fashion that makes an iron and arbitrary rule of discipline of

more importance than a child's heart, and which leaves the impression that the school-house and its grounds are similar to a prison and its yard. The children are your children, or your neighbor's; and you and your neighbor help to foot the bills of expense. Then let the children have the full benefit of the best that can be provided for them; and they will be much the happier for it, and learn their lessons better, and be less desirous of "playing hookey," and retain better health, and in every way be the more fully profited by their education.

The doors of a school-house where hundreds of children congregate, should be very wide, and should open *outwardly* so as to prevent any blockade in the event of a panic occurring. The halls should be wide, and the stairs isolated by solid brick walls to make them fire-proof. Heating and ventilation in such crowded rooms require to be thorough and even, for children need an equable temperature and plenty of fresh air without cold currents. What has been said on these topics in other chapters will be a sufficient guide to the principles that are to be followed in the school-room. A fair general temperature for a school-room is 66° F., the robust and hearty doing with a degree or two lower, the delicate, or ill-fed or poorly clad mayhap requiring two or three degrees higher. Children would soon fall into the habit of requiring a heat of 75° F., or even higher, if a considerate teacher failed to regulate the room by a thermometer; and the high temperature would quickly make them tender and ready to take cold on slight exposure. Germany and other European countries usually direct the school-room temperature to be about 60° to 62° F., but that is too low for the northern American States. No child should sit in a school room with wet and cold feet, for serious colds too frequently result from such neglect.

Ventilation.—The amount of air needed by a child from ten to fourteen years old, is practically about 2,000 cubic feet per hour. Schools should be built with a proper regard to the air-space that is to be allowed to each child in the room, so that the ventilation can be regulated to furnish the necessary volume of air correctly. A height of twelve and a half to thirteen feet in the ceiling, is a fair average. In such a room, five square feet of *floor-space* for each scholar is a proper allowance, if the escape drafts and supply are ample and well regulated. An *air-space* of 300 cubic feet for each pupil, is a good allowance. In Germany, the air-space per scholar is from 120 to 200 feet; and as their ventilating arrange-

ments are generally poor (though the heating is excellent), this is far too little. In New York, the ventilation is admirable, but the provision for air-space is but 70 to 100 cubic feet to a pupil, according to age. This is sadly below what it should be; yet in some of the Brooklyn schools the air-space has been found reduced to 40 and even to 15 cubic feet! No wonder that diphtheria and scarlet fever spread through such schools like a devastating wild-fire, once they get a foot-hold.

Cleanliness about the school-house premises is simply imperative. Where so many living beings are crowded together day after day, no semblance of impurity should be allowed to exist. Rooms, halls, cellar, yard, water-closets, all should be brushed and scrubbed and disinfected in the most perfect manner. Too often is it the plain fact that neglect of a school-house drain or vault has given rise to a severe epidemic of diphtheria, and this even in country villages. The most intelligent system of inspection and of purification should be established, and especially in the crowded public schools of cities.

In this connection it may be mentioned that school janitors should be directed to open all school-rooms widely after the pupils have gone, and admit a flood of out-door air for a sufficient time. Of course this lets out the body of heated air and cools the walls of the room, whence more firing and a larger coal-bill. But that heated air had become more or less impure, and should be removed; and a few dollars extra for coal is the merest trifle when the health of hundreds of helpless children is in question. Dr. D. F. Lincoln offers some suggestions about purification and ventilation of schools, which are so valuable that I quote them almost entire. He says:

"There is one point which has an especial bearing upon the health of schools. I refer to the practice of drawing air for the use of the school from the cellar, the inlet from the outer air being closed. In winter, for example, the windows of the cellar are extremely likely to be closed, and in many cases very few windows are allowed to be open in the school-rooms. The character of the air of rooms is mainly dependent in winter upon that of the air from the furnaces. Suppose that a school-house containing 800 pupils receives a supply of air equivalent to 2,000 cubic feet per head per hour, or 1,600,000 feet. If we suppose that 3,500 cubic feet per hour enter each room directly from the outer air, we must deduct say 50,000 feet for fourteen rooms, leaving

1,550,000 cubic feet to be furnished by the furnace. If the cellar story contains 60,000 cubic feet, it will supply air for the rooms above sufficient to last $2\frac{1}{3}$ minutes. What then must happen? If all the doors and windows of the cellar are kept tightly closed, less air than formerly must enter the hot-air box. But some must continue to enter, and a large part must come from above, *i. e.*, from the school-rooms to the cellar stairs, following the law which compels cooled air to descend. A circulation of foul air is thus established in a few minutes after the inlet from the pure outer air is closed; warmed foul air ascending to the rooms, and cooler foul air descending to the cellar," (*Buck's Hygiene*, vol II. p. 603). Such a danger requires an inlet-box to the hot-air box of the furnace, by which fresh air from outside shall always find entrance; and the cellar itself should at all times be scrupulously clean and fresh.

Light.—Children going to school are quite liable to grow near-sighted, chiefly from placing their book at a wrong angle and having the light fall upon it in an improper direction. A bent or cramped position is also hurtful to the eyes. It is during school-years that the majority of persons become near or short-sighted, if they do not inherit that infirmity; for after the twentieth or twenty-fifth year only a limited number of people are likely to acquire this condition. These facts make it very important for parents and teachers to take excellent care of the eyes of children going to school, as will be directed in another chapter.

For lighting a school-room to the greatest advantage for the eyes, the following rules are proper:

The sill of the windows should be high enough to come above the level of the eyes of scholars sitting down, as light entering at the level of the eyes is dazzling. Venetian blinds, with movable slats, should be provided on the inside; as they can be made to moderate the light when too strong, and to throw it in any desired direction. School children require plenty of light, that the center and corners of the room may be thoroughly lighted without any place being dazzling. Curtains obstruct the light in great measure, and cannot be made to regulate it advantageously. Venetian blinds also admit free ventilation through their slats in warm weather.

The tops of windows should reach quite near the ceiling, so as to get the fullest benefit of the light entering from above and that reflected from the ceiling. Light entering from the higher panes

of such a window, falls upon the books of the children at the most desirable angle. The walls should be gray and the ceilings white.

The black-board should never be between the windows, for it greatly taxes the scholars to see the work on the board in such a position. And the desks should be so arranged that the windows shall not be in front of the scholars, for light entering in that direction is ruinous to the sight. If the windows are at the back of the scholars, the pupils sit more or less in their own shadow, which is hurtful to the eyes. Windows at the left of the pupils are in the most desirable position, and then there may also be some at the back; but windows at the right are to be avoided if possible.

Desks.—School-desks should be adjusted to the stature of different children, three grades in a room being none too many in a large school. The height of the seat from the floor should not be so great as to lift the scholars' feet from the floor, nor so low as to cause the knees to be elevated. The front edge of the seat should be an inch and a half to two inches forward of a perpendicular line from the edge of the desk, which will keep the child sufficiently upright, and prevent leaning over in study or writing. The height of the desk itself should be regulated for the different children so that when the pupils sit upright with the arms hanging down, the near edge of the desk will be about an inch above the elbows of boys, and about half an inch higher than this for girls. At this height, both the eyes and the spine of children are most fully accommodated,—lower desks causing a forward bend that is pressing upon the eyes and weakening to the back; higher desks compelling a twist of the body and elevation of one shoulder in writing, which many times result in spinal curvature. Children should be assigned their seats according to the height of desk they need, rather than by their grade in studies. Near-sighted children should sit near the teacher; and desks for these should have the lid in two pieces, and so hinged that the near piece can be tilted to an angle like the music holder of a piano. In this position, the book can be kept in a position of about 60° from the horizontal—an important item with near-sighted children.

Course of Study.—Very many errors in the American system of education call for radical changes. Among these are assigning too many pupils to a teacher, and entirely too much labor in and out of school hours for both teacher and scholar. A routine exactation in studies which demands that all children in a grade shall

learn the same amount per day, and this commonly measured by the ability of the brightest scholars without any reserve in favor of the slower ones. Lack of adaptation of studies to different classes, which renders it impossible to cultivate valuable traits of genius while restraining their abnormal development, and demands the same amount of mathematics or languages from the incapable as from the naturally qualified in either line. These and many similar problems in education call for regulation, and enough money is expended in public schools and colleges to adjust them properly. But these are questions in mental science that cannot be discussed in a volume like this; and I despair of seeing them solved so long as people shall elect for their school guardians so many saloon-keepers and other ignorant men—who are better prepared to squander the public money for their own benefit, than they are to fathom the needs of young minds in a system of education. Denominational colleges no doubt will yet do much of this for the elder scholars, and from them the influence may in time reach the lower schools and benefit the younger pupils.

The number of hours a day occupied in studying, must be regulated by the age and strength of the child; and the average taken for a standard should always be that which will most nearly accord with the capacity and strength of the less favored children. Scholars below seven years of age, should be limited to three hours or a little less in school. Below ten years, three and a half hours are sufficient. From ten to twelve years, four hours may be allowed. From twelve to sixteen years, or until the stages of puberty have been established, five hours are the best average, and should not be exceeded. After puberty has really been completed and the nervous system again settled (p. 115), six hours may be given to study, in and out of school. The hours named before this period are for work in school, and then no study should be done outside of the school. Such an arrangement is theoretically adopted in many schools, but the daily tasks are so numerous and extended that practically the pupil is not only kept in the school-house more hours than are proper, but is compelled to study about as many hours at home as at school.

"It is one of the best established laws of physiology, that work in excess of the powers of the system adds nothing to the result achieved." This is especially true of brain-work upon the young,—who will actually *learn* more and *know* more if their daily hours of study are curtailed as above indicated, than if they

are forced to double those hours and get weary under the restraint of confinement in school. It is this surplus of study above strength that brings on weariness, as explained in a previous chapter; and when this drain of the bodily vigor begins in the earlier growing years, its effect in retarding development and weakening the entire frame may leave their pernicious impress for years, or possibly for the remainder of life.

During the period of puberty, as already stated, the entire frame grows rapidly and the nervous system is exceedingly sensitive. With this sudden accession of growth the whole emotional nature is very impressible; and both body and mind make heavy demands upon the nutritive functions, and this especially with girls. Women are more easily overtaxed than young men at this stage of life, and cannot physically bear the strain of hard study with safety to themselves. Ambition may carry them through a full course of study by sheer force of will, and for some years sustain them in pursuing the same curriculum as young men; but that is a strain upon the system which exhausts and finally wrecks it, unless the studies are moderated sufficiently to prevent disturbance in woman's new functional life and her emotional nature.

Those who make a hobby of the co-education of the sexes, are fond of contending that woman is the intellectual equal of man. In some respects she is his superior; but when this is said and known, it does not follow that woman can physically undergo the same mental exertions with man at this period of life, and then have enough stamina left to sustain those monthly drafts upon her strength, with their nervous disturbances that belong to her sex and to which man in his organization is a total stranger. It is not at all a question of sentiment; but a question of physiology that vitally bears upon the health of America's future wives and mothers, and through them upon the race. Everywhere and always the most emphatic teaching of physiology is this: that women can rarely endure the heavy exactions of hard study now commonly forced upon them during this forming period of life; and the attempt to endure them, though apparently successful for the time, too frequently leaves the woman bankrupt in mental vigor and shattered in her constitution.

"It were better not to educate girls at all between the ages of fourteen and eighteen, unless it can be done with careful reference to their bodily health. To-day the American woman is too often physically unfit for her duties as a woman. She is not fully up to

what nature asks from her as wife and mother. Our growing girls are endowed with organizations so highly sensitive and impressionable, that we expose them to needless dangers when we attempt to overtax them mentally . . . The cases I see of breaking-down among women between sixteen and nineteen who belong to female schools or colleges, are out of all proportion larger than the number of like failures among young men of the same ages.

"How often and earnestly is the doctor called upon to remonstrate against this growing evil. He is well enough aware that many sturdy girls stand the strain. But he knows also that very many do not, and that the brain, sick with multiplied studies, plods on doing poor work until somebody wonders what is the matter with that girl; or she is left to scramble through, or to break down with weak eyes, headaches, neuralgias, or what not. I am perfectly confident that I shall be told that girls ought to be able to study hard between fourteen and eighteen years without injury, if boys can. But the boys of to-day are getting their toughest education later and later in life, while girls leave school at the same age as they did thirty years ago. It used to be common for boys to enter college at 14, at present 18 is the usual age of admission at Harvard or Yale. Compare the scale of studies for both sexes half a century ago with that of to-day. Its demands are vastly more exacting than they were,—a difference fraught with no evil for men who attack the graver studies later in life; but most perilous for girls, who are still expected to leave school at eighteen or earlier.

"I firmly believe that, as concerns the physical failure of women, they would do far better if the brain were very lightly taxed and the school-hours but three or four a day until they reach the age of seventeen at least. Anything, indeed, were better than loss of health; and if it be in any case a question of doubt, the school should be unhesitatingly abandoned, or its hours lessened, as at least in part the source of very many of the nervous maladies with which our women are troubled."—*S. Weir Mitchell, M. D., in "Wear and Tear."*

In discussing the question of pushing school-work at the expense of physical development, Dr. Gregg makes the following remarks: "Every physician can point to students whose splendid cerebral development has been paid for by emaciated limbs, enfeebled digestion, and disordered lungs. Every biography of the intellectually great records the dangers they have encountered,

often those to which they have succumbed, in overstepping the ordinary bounds of human capacity; and while beckoning onward to the glories of their almost preternatural achievements, by way of warning, register the fearful penalty of disease, suffering, and bodily infirmity which Nature exacts as the price for this partial and inharmonious grandeur. It cannot be otherwise. The brain cannot take more than its share without injury to the other organs. It cannot *do* more than its share without depriving other organs of that exercise and nourishment which are essential to their health and vigor."

These remarks apply equally to girls and boys, to young men as well as to young women. But they have a double signification and emphasis in the case of women, because her peculiar organization and functions demand an extra share of nutrient pabulum and of physiological rest; and she cannot be stinted and robbed of these by severe brain-work, without detriment to her womanhood and warpage of her mentality. "The system never does two things well at the same time," says Dr. Edward H. Clarke in his volume on 'Sex in Education.' "The muscles and the brain cannot functionate in their best way at the same moment. Brain-work and stomach-work interfere with each other if attempted together. The experiment of trying to digest a hearty supper and to sleep during the process, has sometimes cost the careless experimenter his life. The physiological principle of doing only one thing at a time if you would do it well, holds as truly of the growth of the organization as it does of the performance of any of its functions. If excessive labor—either mental or physical—is imposed upon children—male or female—their development will be in some way checked. If the schoolmaster overworks the brains of his pupils, he diverts force to the brain that is needed elsewhere. He spends in the study of geography, arithmetic, Latin, Greek, and chemistry,—in the brain-work of the school-room,—force that should have been spent in the manufacture of blood, muscle and nerve. The results are monstrous brains and puny bodies, abnormally active cerebration and abnormally weak digestion, flowing thought and constipated bowels, lofty aspirations and distressing neuralgic sensations." And to such derangements the nervousness, over-sensitiveness and hysteria of women are direct sequences.

The signs of brain-weariness are different with different people. Loss of flesh, thinness of blood, and a pallid countenance, are

common, together with dark bands under the eyes. Disturbed sleep is also very common. Headache, either on one side and in one eye-ball or through the entire forehead, is nearly constant with many; and "school headache" has come to be looked upon as inevitable to getting an education instead of being rightly estimated as nature's warning of fatigue. A general sense of tiredness or weariness is also nearly universal. Neuralgia, toothache, spinal suffering or tenderness, and other nerve-pains develop in some. When any of these disturbances appear during school-life, it will be safe to conclude that the hours of study and the number of studies are too great, and that an insufficient amount of daily muscular exercise is obtained (p. 123). In such case, an emphatic change and reduction of mental labor cannot be made too promptly. Especially is disturbance or loss of sleep to be heeded carefully, for the brain gets no rest except during sleep; and when the mind is so excessively active as to diminish this rest instead of increasing it,—for the amount of sleep should be enlarged when the mind is in healthy and vigorous use,—then the brain is being exhausted, and study must be curtailed or discontinued if health is to be preserved. Frequent faintings often come from exhaustion.

"Change of employment is as good as a rest." This is an expression formulated from observing that when one set of muscles are getting tired, they may be rested in considerable measure by turning to some work that calls another set into action (p. 170). Certainly this gives repose to the first set; and when the previous exertion has not been too protracted or violent, the new form of labor may be pursued with a sense of freshness. What is thus true of the muscular structures, is even more distinct in mental occupations. By pursuing one particular line of thought for several hours, the most elastic brain will weary; and if this plan is continued day after day, the toughest will break down. By giving the mind diversity of action, and turning its attention from one class of topics to another and a different class, various portions of the brain are brought into action, and alternations of use and rest are secured to these.

It is upon this physiological principle that different studies are pursued each day in school. The younger the pupil, the less time should he be required to give to any one lesson or recitation; and the recitations should have a period of rest between them, and those lessons which come nearest together in time should be as dissimilar as possible in character. Mr. Chadwick, discussing

this subject and estimating the powers of mental concentration at various ages, suggested the following: A child from five to seven years old may attend to one subject (a single lesson) about 15 minutes; from seven to ten years, about 20 minutes; from ten to twelve years, about 25 minutes; from twelve to sixteen or eighteen years, about 30 minutes. The studies pursued should be suited to the comprehension of the child; and the too common habit of pushing upon a child's attention one or more studies quite beyond its present mental development to understand, is at once senseless in the school authorities and exhausting to the pupil.

"It is worthy of notice that the hardest work of the [school] year comes at a season when teachers and pupils are least able to bear it. In the winter many work to the utmost of their strength, sustained by the stimulating climate. In the spring this stimulus fails, appetite for food is lessened, and a certain languor is felt by many perfectly sound persons. It is then that the work of the year approaches its climax, and the entire school for two months is conscious of a severe spur to increased effort. The yearly examination at the close of June requires additional exertion in preparing papers, correcting, marking, averaging, and in making ready for a public exhibition. Prof. H. I. Bowditch, of Massachusetts, in a paper to the State Board of Health says; 'I have seen not a few patients—scholars—who, under the violent stimulus put upon them by an approaching exhibition, or examination for rank or for prizes, have sunk immediately after such extra intellectual labor, wholly prostrated in mind and body; and where I have seen them, far-advanced consumption was plain. Such cases are utterly hopeless.'" (Dr. F. D. Lincoln. *Op. cit.*)

Teachers are themselves greatly over-worked, and are driven helplessly, like so many machines, under the exactions and regulations of School Boards. They usually see the taxations and dangers that I have endeavored to point out, but have no power or hope toward correcting them. The remedy lies in parents acquainting themselves thoroughly with this subject matter, and then systematically and conjointly insisting that the methods of study shall be established and conducted upon a strictly physiological basis in primary schools, intermediate schools, high schools, and colleges. It is their duty and their right judiciously to see that all these questions of education are regulated properly.

CHAPTER XXIII.

HOW TO CARE FOR THE EYES.

DEFECT in the sight is a great grievance, and should be prevented if at all possible; and very much can be done toward this when the defect is not hereditary. I shall offer a few plain rules for the care of these delicate organs.

I. Avoid food that is too gross, and which taints the blood and makes the eyelids irritable. Children and young people eating freely of pork, corned beef, gravies, buckwheat, and similar heating articles, are very liable to troubles of the eyelids, with "stys," gummy discharges, etc.

II. Innutritious food, by thinning the blood and weakening the system, is pretty sure to weaken the eyes. This is often seen in asylums, where the dietary is reduced to the starvation point for the sake of economy, and where purulent and scrofulous inflammation of the eyes is a scourge. Children of very poor parents frequently suffer from the same cause. Full nourishment is a necessity to good eyes. People saturated with tobacco often get severe eye troubles, and seem absolutely incurable while they continue the habit.

III. Avoid dust. Very fine dust is exceedingly irritating to the eyes. The fearful sore eyes common to Egyptians is generally due to the minute particles of dust that load the atmosphere in that country during much of the year. In some of the prairie and other western sections of our own country, the air is full of very fine particles of dust during the warm months, and the result to unprotected eyes is damaging.

IV. Never use the eyes in reading, sewing, or other fine work, in an ill-lighted room, nor at twilight. Such use puts them under a severe strain, which is taxing to the best eyes and ruinous to poor ones. Always have a good light; and stop reading, etc., the moment the light begins to get dim.

V. Do not use the eyes on any white or bright-colored object when the sun or a strong artificial light is falling directly upon it. Snow-blindness, frequent in the high northern latitudes during winter from the dazzling reflection of the sun upon the snow, illustrates the injury that may be received from such brightness. Reading or sewing on white goods while the sun shines upon them, is liable to cause similar injury. A bright lamp-light should

not fall directly and at short distance upon a book or the goods. Rooms with white walls, and the windows not sufficiently curtained to subdue the glare of the sun, are also hurtful to the sight. Red, yellow, and black goods reflect the more taxing rays of color, and are trying to the eyes. Curtains to windows, and walls of rooms, are best when of neutral colors,—grey or drab.

VI. Avoid facing the light, either the sun or a lamp, when reading or doing fine work. The *best* position is to have the light come partly from behind and from the left side. Do not have your own shadow fall upon your book or work, when using an artificial light.

VII. An artificial light should be steady, not flickering; otherwise the vision will be taxed so much by the rapidly changing degree of light as to weary the eyes. In day-time, it is equally taxing to read or work where any moving object is frequently varying the light, as the leaves of a tree or a vine.

VIII. Never read in a car or other vehicle when in motion. The eye is made to suit itself to different distances—as when we alternately look at objects five, or ten, or fifty feet away—by a small muscle that presses upon the eye-ball and varies its shape. This is called the “muscle of accommodation.” The vibrations of a book or newspaper read in a moving car are very rapid, and cause equally rapid vibrations in this muscle; and thus the muscle itself is wearied, and the eyeball and its nerves are over-strained.

IX. Cease using the eyes the moment they begin to get wearied. This may be known by the outlines of the letters or of the work seeming to get dim, or confused, or to run together. The eye-balls also begin to ache, and there is a sense of relief felt in looking away from the book or work. Bright colors are much more taxing than neutral tints, and work on them cannot be continued long at a time. Fine print is taxing; so is a book or paper printed in small type, with poor ink and on bad paper.

X. Hold a book or a paper at an angle of about 60 degrees, and do not lay it down flat nor hold it perpendicular. It should also be held squarely in front of the face, and not to one side nor at a side angle. Never read while lying down. This is a very common habit, especially with ladies; but it is a very bad one.

Near-Sightedness.—This is becoming a too common trouble among young people. Sometimes it is inherited, when it begins to show itself usually between the ages of seven and nine years. But it is much more commonly acquired, and very especially dur-

ing the years of school life (p. 190), or between the thirteenth or sixteenth years. Slender and studious children are most likely to acquire it, and some writers have about concluded that the acquisition of near-sightedness is inseparable from an educated community. This is too sweeping a conclusion; for the defect is most commonly the result of injudicious habits in the use of the eyes, especially those pointed out in numbers 4, 5, 6 and 9, of the above rules. To these add the bad habit, that so easily grows on children, of holding their book or paper too near to the eyes while studying or reading. The natural distance for a healthy eye is from $12\frac{1}{2}$ to 14 inches for ordinary print. Children unconsciously fall into the custom of lessening this distance, bringing the book eleven or ten inches from the eyes. Small letters poorly printed, and an ill-lighted school-room, at once favor this; and so does the habit of home reading at twilight. Teachers and parents are not sufficiently watchful; and presently the shape of the child's eye is altered, its focus is shortened, and the child has imperceptibly become near or short-sighted.

The production of this defect is slowly progressive and may require from one to four or five years to establish it permanently. It is noticed that the child holds his book nearer to him than others do, that he is inclined to draw the eyelids closely when reading, that he does not recognize persons or things at a moderate distance from him, does not clearly see the figures or words on the black-board, cannot read the print of this book easily at a distance of about four feet. A frontal headache is a common complaint during this period of development (p. 197), and the trouble is too generally an outgrowth of over-taxation of eyes and brain in study and reading.

When near-sightedness is first noticed, it is usually within the easy possibilities to correct it; when once firmly established it cannot be overcome, and in adult life it may be fostered and promoted till the very roots of the optic nerves are changed in their structure and very serious defects result. I am familiar with a gentleman who invariably reads his morning paper (and a most wretchedly printed newspaper it is) while coming from his home to his office in the street cars. Some mornings it is dull and foggy, giving a deficient light; other mornings it is dazzlingly bright, and the sun pours directly upon his paper; but he reads on and on, regardless of light, dimness, car movements, or friendly remon-

strances. Five years ago, he held the paper about nine inches from the eyes; to-day he holds it about five inches, and is compelled to peer at it with eyes a little bulging and partially crossed from the nearness of the object. By his own act, the defect has become a sad one and promises to end in total blindness in a robust gentleman now only about 45 years of age.

Advancing near-sightedness calls for removal from school for a few months or a year, and the forbidding of all reading except possibly a few minutes a day of large and very clear type. Then the eye must be trained to look at distant objects instead of at those near by. Gradually increase these efforts, first accustoming the sight to examine persons and things forty or fifty feet away, then one or two hundred feet, and thus progressively onward. City life does not favor this kind of training, and requires great perseverance to effect much benefit; but country life, where there is scope for trying to discern objects at long distances, is admirable for this purpose. A few months thus used, will frequently make great changes in the eyes of those becoming near-sighted. If the vision remain imperfect in this particular, then suitable spectacles should be used as hereafter directed.

Weak Sight.—Under this term are included cases of impaired vision resulting from over-use of the eyes, and from disregard of numbers 7, 8 and 9 of the above rules. Ill-health, an impoverished state of the blood, general over-taxation of the nervous system, the use of liquors and tobacco, and chronic prostration from any source, have a material influence in disturbing vision and deranging the eyes.

Among the evidences of this class of disturbances are ill-defined outlines to objects, which are not seen distinctly at the person's focus, but become blurred and confused. Increase of such confusion on turning from one object to another, requiring that the latter object shall be peered at for several seconds before it will assume definite shape or be clearly recognized,—testimony that the muscles of accommodation have become fatigued. Sensitiveness to the light increasing to irritation, need of averting the face from a lamp or other ordinary light, and finally to painfulness if the eyes are not constantly protected by colored glasses,—even ordinary daylight becoming a source of discomfort or actual distress. These latter degrees of suffering rarely occur except from continued neglect with ill-health; and they may become so severe as to make it nearly impossible for one to venture out of a darkened room.

Recent cases of weak sight are usually quite curable, but demand months of care. The eyes must have the fullest possible rest, the above rules must be followed scrupulously, all sources of nervous taxation and over-strain must be escaped, the general health must be brought up, and bad habits must be discontinued if proper sight would be regained. Good digestion, fresh air, moderate exercise, plenty of sleep (ten hours), relief from care and anxiety, and discontinuance of study and reading, are simply imperative. Brightly lighted rooms are to be avoided; and moderately colored glasses—blue or grey—are to be worn when in any strong light. A case of chronic weakness involves such changes in the structures as not to hold out promise of curation; but they may be benefited by continued care and by judiciously bringing up the general health.

Using Spectacles.—There are many misconceptions as to the use of spectacles. Some expect entirely too much from them,—as did the man in the story, who went to buy a pair of these “helps to read,” and was ready to declare the optician a swindler for not “helping” him, the man not being able to read at all. But there are many persons who think the use of spectacles is injurious to the eyes, and refuse to resort to them when they manifestly should do so. Perhaps these have bought glasses from an itinerant or incompetent person, and really have been using an article that is wholly unsuited to their needs.

Spectacles differ in the fact that one class is designed for people with short sight, to assist them in discerning clearly objects at a distance; while another class is for people who have long sight and can see objects at a distance, but need help to see things near by—to sew, to read, etc. The two defects in sight are quite the opposite of each other, and cannot be assisted by the same glasses. Persons with short sight must not read or sew or do any other close work while wearing the glasses intended to assist them in seeing at a distance. That is a very injurious habit, and may utterly ruin the eyes. Always remove such glasses when at such close work, and accustom the eyes at such times to do without any glasses in the hope of thus improving the focus, or on compulsion use another pair of spectacles designed to aid the vision on objects near by.

In like manner, persons with long sight must not look through their reading glasses at objects several feet away. These spectacles are not intended for such purposes; and this use of them would

damage their power of long vision. If they need help to discern distant objects, which elderly people generally do, then they must have another pair of spectacles for this purpose.

No spectacles, whether for near work or far-seeing, should ever put a glare upon objects. When they make things looked at appear distinct and clear, without confusion in outline and without brightness that is tiresome, then they are suited to their respective purposes. It requires care and judicious caution to select suitable glasses, which often have to be tested for several days before their suitableness can be determined. Persons who can consult a really skilled oculist, should by all means do so; but an ill-educated and boastful man *assuming* to be an oculist, is generally worse than nothing, and is a destroyer of eyes by his ignorance. Most people can find for themselves the spectacles that will best suit them, if they will take time to test them carefully as above indicated.

Sometimes people are troubled lest they get spectacles that are too "old" for them, *i. e.*, which are as high in their optical power as these people might think would be better adapted to persons older than they themselves are. There is a certain measure of truth in this, the idea really being that the spectacles chosen should not be of too strong a power for themselves. This is not always a question of age; for the eyes change variously without regard to one's years. The rule always is, to use only such glasses—for either short-sightedness or far-sightedness—as will not put a dazzling glare upon objects. When this is done, the glasses will be found of the lowest power suitable for that particular person, and their use will not weary the eyes. A person cannot judge in the least about the spectacles they need by considering their age, for one at forty years may need precisely the same power of glass that is required by another of sixty years. In like manner it is impossible for one person to select spectacles for another. Each must be suited exactly for himself.

In wearing colored glasses, the object is chiefly to shield the eyes from too much light, for which purpose perfectly plain glasses are used. When colored spectacles are to be worn for near or long sight, they are chosen on the same rule as those that are uncolored. Blue and grey (smoke) colors are most suitable, green being seldom employed. The depth of the color should be as mild as possible; as a glass of too deep tone strains the eyes in seeing through it at all, just as a veil taxes the eyes of the ladies.

Some persons advancing in life cannot find spectacles to suit

them, even with the aid of an experienced oculist. The nerves of the eyes may have undergone change without any especial local disease being present; and spectacles cannot supply the wants of altered nerve structure, but only assist the front parts of the eye under the laws of optics.

CHAPTER XXIV.

ON THE MANAGEMENT OF BABIES.

SOME years ago a series of communications were published in my *Medical Recorder*, which gave much pleasure to my readers. At the special request of friends, I here republish them in book form,—this and the following few chapters being some of the articles in question:

Every mother thinks she knows exactly how to manage a baby, and I certainly will not dispute them so far as managing their own babies goes. But all babies are not alike, any more than all people; and so it turns out that they cannot all be managed in exactly the same way. Some fine managers will tell you they don't believe in coaxing children to sleep, for it spoils them; and they just nurse them and lay them down in their little bed, and let them go to sleep or cry, just as they have a mind to. Now that will do very well when the child is willing, and has no particular sensibilities or no disposition to restlessness. Many children are so; and will lie in their cribs and crow till tired, and then will go to sleep without any trouble. Such are easily managed, for they manage themselves; and if all babies were of that constitution, mothers would have fewer burdens.

But a great many children are sensitive and restless by nature. They are born with "nerves," and those nerves are wide-awake all over. Such children are active, impressible, and irrepressible. From the first hours of their babyhood they seem inclined to perpetual wakefulness and perpetual motion; and it is almost impossible for them to get nerves, muscles and brain quieted down so as to secure good sleep. Conversation or other ordinary noises disturb them, a full light in the room keeps them awake, and trifling improprieties in diet or clothing make them fretful and restless. To lay such a child down with the purpose of letting it "cry itself to

sleep," is a cruelty of the first order. To walk it and toss it are indeed follies. To shake it and "spat" it to make it go to sleep, are barbarisms allied to insanity.

A mother with such a child has a lustrous jewel under her guidance. If guided aright, it may become a brilliant; but if crossed and chafed in early life, it may develop into a diamond with a sad flaw in its nervous constitution, and so be of little value. Such babes need comforting, nestling and coddling. I am rather averse to rocking; for it is a pleasant motion, and a child may lie awake by the hour for the enjoyment. My own plan is a plain one, with a little trouble in it at times; but it is effectual, and gives my baby sweet sleep and good health. A baby who gets too little sleep, or is disturbed much in its resting hours, fails to get a good start in life.

I never put my babes to sleep in our family room, where there are noise and light in the evenings. A babe wants darkness and quiet, moderate warmth and fresh air. I nurse mine till well satisfied, neither stuffing nor stinting, and lie it in an adjoining room moderately warmed and darkened. If the weather is cool, I wrap it well and see that its feet are warm, but never cover it so as to cause sweating under the cover. A common error is to use too much clothing lest the child take cold, which is quite sure to make it kick off the covers during the night, and so get that cold.

Should a baby cry a little on being put to bed, pay no heed to it. But if it cry violently, take it up, nestle it to your bosom, rock it gently, and let it quietly feel that mother is near and full of love. Soon its excitement will pass off, its tears dry up, its breathing become soft and your child fall happily asleep upon your breast.

If a child has to be put to sleep in the sitting room of the family, by all means place its crib in that corner where there is least heat but no direct draft; secure good ventilation to the room; and always protect the baby's eyes from the rays of the evening lamp, and the glare of a window by day. The quiet and healthful sleep of your darling will richly repay you for these little attentions. Their neglect may cause it and you many nights of restless tossing.

CHAPTER XXV.

ABOUT BREAKING DOWN THE GIRLS.

A GREAT deal of talk is heard now-a-days about the idleness and general good-for-nothingness of girls. Such talk is all very well, in its right place; and it seems to me that the place for it is a pretty large one. Some girls are too lazy for anything; and they sit around the house, and loll in rocking-chairs, and read novels, and putter at bits of fancy-work, and talk scandal about their neighbors, till it needs a great amount of charity to believe they are really of any use in this world.

The dear girls themselves are not always so much to blame as their parents, who encourage such idleness and gossiping in their children. Parents should have right notions themselves, and understand that it is a harm to a girl to be brought up to do nothing. It gives her false notions about herself, scornful to the poor and deceitful to the rich, and fills her with nervousness and other diseases. If girls have enough money to stand in no need of right hard work, their riches will only make them miserable if they grow up to do nothing at all. God has ordained that all should be busied at something useful; and any family that gets above His ways will suffer for it sometime.

But our country has a great many girls that are worked too hard. Among mechanics and farmers and many other families of moderate means, the girls and "women folks" have too much to do. Strong and hearty fathers are apt to measure by their own strength and endurance the strength and endurance of their wife and daughters. And for that matter strong mothers, who never knew sickness for a day, may measure their daughters' strength by their own. The fathers work hard, and all the family is anxious to get on in the world; and so the girls are twitted about "playing lady," and told they mustn't be "idling around," and reminded that the mother used to work so and so "when she was a girl." All through the family, it is work and hurry and drive, from early morning till late night, just as if women were like saw-mills and could run all the time.

If a girl has only small ambition, she gets disheartened and unhappy; and then she grows obstinate and don't want to do anything, because she never gets any credit for what she does, and the harder she works the harder she has to work. Or she contrives to

get away from home into dress-making or something of the kind that is light. Or else she marries the first stick of a man that comes along, for the sake of escaping from the drive and drudgery of her father's house. So it is that many a home has misery brought into it.

But if the girl is ambitious she determines to do her share and not give up to anything. And the willing ones are always made to bear the burdens of the lazy ones, and so have their load of hard work doubled. With the energy of a steam engine such girls work on,—sweeping, cooking, washing, scrubbing, churning, and doing a thousand other things about the house. Not a moment do they rest from early rising till late bed-time; but every minute their hands, bodies and brains are going on the jump and stretch.

Now such kind of work will break any woman. If the constitution is very strong, it will stand a good many years; but at last it will give way all at once, and the woman will die suddenly, and the people will wonder that such a strong person couldn't stand sickness any better. Poor thing! She had stood burdens and taxations all her life, and had no strength left to endure disease, but snapped under it as an old harness would at a moderate pull. But if it is a youngish woman who has to do such constant and heavy work, and she is small in frame and not overly tough, she breaks early. Many, many girls and young wives are taxed and ruined by work, and the parents or husband do not understand why it should be so. They want as much lifting and toiling from a slender woman as would tire out the stoutest man; and they want her to begin it in the morning as soon as they do, and to finish up in the evening two or three hours after the men-folks have quit and are gossiping with their neighbors or snoozing on the lounge.

A woman's work should be graded by her strength, and no woman should ever be put to her full utmost. If parents and husbands want to break down daughters and wife, they can do it surely by straining work kept up day after day. And then they will spend the rest of their lives in trying to get back what was lost through a broom or in a wash-tub. But if parents and husbands want wife and daughters comfortable, healthy, and models of cheerfulness, they will watch that the burdens do not become too heavy, and regulate the work to the strength according to reason. No woman of the least ambition will ever idle if she feels well; and young women of spirit need to be stopped

long before they tire and lag. This is the only way to save their constitutions; and dollars saved by being penurious about hiring enough help in the house, will cost hundreds of dollars afterwards in doctors' bills and misery.

CHAPTER XXVI.

A TALK WITH THE GIRLS.

I KNOW, girls, that your warm young blood don't like prosy things, and I shall not cross you by a long lecture. But your loving hearts find pleasure in tender things, and there are many of these connected with health. For your fun and jollity will be of small consequence if health fail; and "old women" at thirty are not the happiest of people. I wish you could be as gay and hilarious all your days, as you are now; with eyes sparkling, and cheeks rosy, and step elastic, and hearts without a sorrow.

But girls are so thoughtless. They don't intend to be; but they really find it very puzzling to see what connection there can be between a pair of thin shoes and sore lungs, or between heavy under-clothing and an aching back with a poor appetite, yet the connection is just as certain as that between scratching the match and getting a light.

No, you don't like the headache, shut up in a dark room, lying on the lounge, with the smell of camphor and vinegar, and every little noise and jar causing your poor head to feel as if it would split. I wish it were possible for me to take it all away this instant. But the hot bread and strong coffee and sweets and ice cream and all the other things you ate last night at ten o'clock, made a little heavier load than your stomach could bear. It is no use to take drops, or powders, or any other medicine. The stomach is worn and sickened, the head cannot get relief till the tired stomach has rested and recovered itself. Very hard to bear, indeed, but it can't be helped now; and you know that mother was quite opposed to your going to the party. She thought you were not exactly in condition to go, and that you would be likely to stay too late; but you got quite angry about it, and declared you were never allowed to go anywhere, and finally went off with a promise to be back at eleven o'clock, but didn't return until almost two. Really it is too bad that your head aches so, but—

There was your friend, Maybel Wilson. She declared she *would* go to the Jameison's social if it killed her. And she would wear her fancy dress without a shawl, for fear of mussing it; and her shoes were too thin for a dry spell in July, and perfectly ridiculous to be worn on a damp night in December. But she hurt her dear mother's feelings terribly by her manner of refusing to wear a shawl or put on heavier shoes, and declared she was not going to make a "fright" of herself. The exposures, and sudden changes from heat to cold, and excitement, were too much for her frail body. She had a very severe pneumonia from them, and it is now doubtful whether her feeble lungs will ever be sound again, for it is feared that she is fast becoming consumptive.

Girls often think that mother is very prosy and unsympathizing, and find it very hard to submit to her wishes. But when her wise and loving counsel is unheeded, and sickness comes because Nature's laws have been wantonly violated, then mother is expected to nurse the sufferer through long days and longer nights—losing sleep, taking unnumbered steps, bearing a load of anxieties on her sad heart, and attending to scores of little duties with her weary body. You would be astonished if mother did not perform all these countless duties for you; and if father were indifferent to your suffering and danger. And yet you have, by your own wilfulness, rejected the advice of the dearest friends you can ever have; and have brought sorrow and labor and watching into the house. Please think of it, girls; for your selfishness has caused long weeks of anguish to those dear ones, and a total disregard to the comforts of others is a very unlovely thing in a young woman.

CHAPTER XXVII.

MY NEIGHBOR, MRS. JOHNSON.

My neighbor, Mrs. Johnson, died last spring, and her death is a kind of mystery, for it seems as if there was no particular kind of disease to cause it. The doctor was puzzled all the way through her sickness, and says he gave her almost no medicine of any kind, for he couldn't find any disease. She was only about 25 years of age, and was always considered a healthy young woman. I have known her ever since she was a girl, and I believe there are

some things about her life that all men and women ought to know and to think upon.

When Amanda Nutting married Samuel Johnson, she was a ruddy, healthy girl of 18 years, and as stout and active a girl as you would find in the whole country. The young couple went to housekeeping on a big farm, where Mr. Johnson had built him a neat house before he took his bride. This house had three small rooms on the first floor; and two rooms up-stairs built under the roof, with a gable-end window to each room. It was heavily plastered and very air-tight, and there was not a tree about it to give it shade in summer or break off the winds in winter. Its ceiling was rather low, and the great kitchen stove made every one of the three rooms like a bake-oven in summer. When that stove was heated up in cooking or baking, it seemed as though not a breath of livable air could be had in the house. In winter time the thin stove in the living room would be red-hot one hour, and almost cold the next hour; and sometimes I have visited there when the air was so smothering I would feel like fainting half the time I staid. And the rooms couldn't be ventilated except by raising the windows and opening an outside door, and that would let in the cold winter air till we were chilled down, and then the doors and windows would be shut till we began to roast again.

You could not get to the cellar without going out of doors, for a closet had been built under the stairway, and it was really the only closet the house had. The cellar way was at the end of the kitchen, around the corner of the house from the kitchen door. The well was a real deep one, I should think about 30 feet to reach the water nearly the year round. It was some 40 feet away from the kitchen porch, (the porch was two real high steps up from the ground), for that was where the "water witch" said was the right place to dig; and the well-curb was high, and all the water had to be drawn with a large heavy oak bucket tied to a rope. About 50 feet around from the kitchen was the wood-pile.

Into this house the young bride went, gay and hopeful; and in it she spent her remaining eight years of life, and there she left four motherless children when she was carried from it to her grave. Before marrying, she tried to get her prospective husband to build each room a couple of feet larger either way, and the first-floor ceiling one foot higher, and the up-stairs high enough to almost be a full story so full windows could be put under the eaves and come near to the floor. She told him these things

would give a chance for closets, and for a cellar stair from the kitchen; and then a woodshed as a lean-to against the end of the kitchen, and a pulley windlass with emptying spout at the well, would save a great deal of hard work. But the extra cost of these in his building plans would have been about \$200; and no one ever knew Sam. Johnson to lay out a dollar for anything that hard work would save. He thought the house was big enough to live in, and that was all they wanted. It was found to be big enough to *die* in, too.

Sam. Johnson was a hard-working man, and was always for "pushing things," and "didn't believe in no nonsense." He expected every one around him to work as hard as he did; and "allowed" that woman had nothing to say about management, and that it wasn't her place to be always contriving ways to spend money. He was counted a model husband to Amanda, only once in a while he would tell her to "hold her tongue" when she was coaxing him pretty hard to fix up something she wanted to save her hard work; or reminded her that he didn't know when he married her that she was going to be so sickly and ailing all the time. Poor soul; she used to look as if she thought it was a sin to want any comforts around the house, and that she wasn't a good wife if she complained when suffering. And Sam. used to go to meeting regularly, and always paid a good share to support the church, and had a large sum of money in bank, and was looked-up to as one of the most fore-handed farmers and respectable citizens in the community.

Amanda did all her own housework, except for about two weeks when each of her children was born, and one week during the hurried part of the harvest work. She would then hire a girl to help her some; but Sam. was always in a fret while the girl was there, and couldn't be satisfied with anything she did, and talked a great deal about how expensive it was to keep help in the house. When their third baby was two weeks old, Amanda wanted him to have a girl stay with them and do the work till after harvest, which would begin in a month more. But he said he couldn't afford such an expense as that, and she must try and get along some way and he would have a girl ten days during harvest this time. Amanda was very pale and weak, and could hardly drag around the house. But she never said another word, but managed to do her washing and ironing and scrubbing and baking, and everything that there is in a farm-house for a woman to do. She never picked up any

after that baby was born, but always looked pale and drooping; and she seemed out of heart all the time except when her husband was by, and then she would try to be lively. But I and her other neighbors could see she was not well, and she looked about so all the time for nearly two years till her fourth baby was born, and after that she just puled away and died when the baby was four months old..

No one could know how much work Amanda did, unless they had done it themselves. A hired man was kept on the farm all the time. She had to do the washing and mending for him, besides for her husband, herself, and her children. All the water used had to be drawn by her with that heavy oak bucket and lifted over the high curb in broiling sun and driving rain.

She carried in all the wood from early spring to late in the fall, and sometimes had to scrape up chips or else hurry and split some of the wood herself. She had to skim the milk, churn, work the butter; make and mend all the week-day clothing of the family; scrub, make soap, and part of the time to do the milking. In spring she made the garden, and cultivated it all the season, for Sam. could not give time to such trash. In summer she would walk a mile to gather blackberries and raspberries in the forenoon, then hurry to cook a big dinner for the workers, and can her berries in the afternoon, and then hurry to get supper. Sam. thought it was a waste of land to plant a patch of berry canes near the house, but was proud of Amanda's "sass" on the winter table.

In the fall, Amanda gathered most of the apples from the old and neglected orchard, carrying them nearly half a mile to the house. And she would pare them by hand, for Sam. couldn't waste money on any of "your Yankee patent machines." And she would dry them on strings, or on boards out in the sun, and run out twenty times a day to drive away the chickens, for Sam. hadn't lumber or time to fix up a drying-stand in the kitchen, and the kitchen was too small to hold one anyway. In the winter she would have to make up the year's underclothing, sew rags and weave her carpet, and keep her time as crowded in winter as in summer. Last summer a year, it was a few months before her last baby was born, she pleaded very hard with Samuel to fix a pump into the well, so she could pump the water right into the kitchen; and then arrange a sink so the water could be run off without her having to carry every drop of it in pails about 100 feet away from the house to empty. But these things, with a tile

drain-pipe to carry off all the kitchen waste to a gully 400 feet away, would cost nigh \$100; and Mr. Johnson was just planning to buy 80 acres of land joining his farm of 320 acres, and so he couldn't spare the money for the improvements. The more land he got, the harder would be the dairy work, washing for another hired man, cooking, and harvest work, on Amanda.

Amanda worked in this kind of a way year in and year out, from the day she became Mrs. Johnson till she lay down upon her bed to die. Every day she walked miles in going to the well, the cellar, the wood-heap and the slop-hole, carrying heavy pails and other things; and all those miles could have been saved by a moderate outlay for little conveniences about the house, and Samuel had plenty of money to pay for them. She had to endure the wilting heat of her small kitchen in summer; while the men-folks had fresh air in the field where the heat was not so great by 20 degrees as in Amanda's kitchen, and they could eat on the cool porch and loll under the shadow north of the house while she was waiting on them and doing up her dishes. She had to stay in the small and smothering rooms at work all winter, and through the long winter evenings, while the men were doing easy work in the open air; and Sam. visited some neighbor on business almost every evening, and drove his close bargains in their large and ventilated rooms, and came home pretty late and built up a great fire to warm himself and nearly smother his wife and children in the little bed-room. And when she was sick, that little low bed-room was almost like a box with the lid shut down,—fired by unshaded sun in summer and by the great stove in the next room in winter,—putting one in mind of the playful wife who jumped into a chest to hide from her husband, and was there smothered to death by the shutting down of the lid.

Amanda never complained. No one of her neighbors ever heard a murmur come from her lips. Samuel wanted things so, and her gentle nature gave way to his wishes without urging any of her own wishes. She got paler each year. Her step got some slower, her ringing songs were dropped, she got thinner, and always had a weary kind of look. For nearly a year before her death we could all see she was dying; but Samuel couldn't see but what she was doing middling well, and felt he had done all his duty when he called in a doctor a few weeks before she was taken away. While she was able to be up and about, he thought she didn't need any medicine only some boneset and wormwood bit-

ters he fixed for her on whiskey; and she used to tell me that it cost so much to have a doctor that she didn't want Samuel to send for one. At last she took her bed, so pale that she didn't seem to have any blood in her to keep her alive. She hadn't an ache or a pain anywhere, but just gradually went down and died.

Now the doctor maybe didn't know what caused the death of young Mrs. Johnson; or maybe he did know and didn't like to tell. Let that be as it will, I know the cause of her taking away. It was overwork in a house too small and tight to be healthful. That's the plain fact; for no woman living can stand up long to such an amount of work, even in a house with rooms large enough to give good breathing space. Her work was twice what it should be for any woman, without children to care for. It would have broken her down, and taken all hope out of her young life, if she had not had a child; and adding to this four children inside of seven years, and her life itself went with it. Samuel Johnson had grown rich in money since he got married; but his wife's sweet life paid for that money, and his motherless children will be trained up by some less gentle hand than Amanda's.

CHAPTER XXVIII.

ABOUT BABY MEN AND WOMEN.

THE truly frightful decline of our youth in bulk, stature, and physical powers, especially our females, is a subject of sorrowful reflection to every thinking mind; and were it not for the hardy foreigners so rapidly flocking to our shores, by which the national stamina is somewhat renovated, at the past or present rate of decline, we should soon be reduced to a nation of dwarfs and pygmies. Our children are rushed from the cradle or maternal lap to the school-room, to mature business life, at short and rapid leaps. The beardless, inexperienced boy, wholly unaccustomed to cares and responsibilities, becomes the head of an extensive business house; and the romping school-girl of to-day, as it were, tomorrow becomes the mistress of a family, as though time and nature could be defrauded out of their just dues.

And the inevitable consequence of thus rushing children into the shoes at once is but too obvious everywhere in our midst.

The boy suddenly transformed into the business man is likely to become spendthrift and dissipated, more likely to fail in health and die early; and almost sure to fail in business and become a bankrupt, for want of age an experience. The tender, delicate female, yet in her teens, immature, and unaccustomed to cares and responsibilities, and wholly unfit to endure the wear and tear of married life, soon fails in health, and sinks to an untimely grave, leaving behind perhaps one or more pale, puny, feeble, sharp-faced, short-lived children, destined soon to follow their imprudent and unfortunate mother. For marriage, to a vast majority of American young women of *this day*, is an irreparable misfortune, and almost synonymous with suicide. Let parents then not be in such hot haste to jump their children from mere boys and girls to men and women, from babies to adults, but give them full time to grow, and develop mind and body, before placing upon their shoulders the onerous cares and burdens of active life; for one staunch, well-matured, well-consolidated young man or woman,—the former twenty-five to thirty, and the latter twenty to twenty-five,—for life and business purposes is worth half a dozen young, tender, immature, and unripe youth.

CHAPTER XXIX.

WALKING AND GOOD HEALTH.

AMONG American women, there is good ground to complain of habits that might be classed under the title, Inertia. The middle and lower classes work hard enough; and although their toils do not equal those of many foreign women, that is because the foreigners overburden the women like so many beasts suited only for work. An American has too much respect for wife, daughter, and sister to permit their being treated like mules. Yet the average American woman usually has all she ought to do; and, in view of her motherhood, is too many times taxed entirely beyond her powers and is thereby broken down early.

But in one particular, American women of the middle and upper classes are much at fault. They do not enjoy enough out-door walking. They house themselves too closely,—the one class grinding themselves down to household duties, and the other class

devoting themselves to fashion and gossip as though their individual salvation depended thereon. Attempts to get abroad into the sunshine come spasmodically, and are made as laborious exertions rather than healthful recreations. One class get abroad once a week or so, dressed in heavy and hampering clothes which drag down the viscera and restrain the natural movements of the limbs. The other class ride in their carriages to concerts or calls, scarcely walking twenty rods in a week. With both classes, the result is feebleness of limb and spine, poor digestion, paleness, and a condition ripe for the national harvest of "nervousness."

No woman can be shut up in the house for weeks and months, unblessed by a free out-door walk, without being the sufferer. Human health absolutely demands walking, and women in particular stand in need of this enjoyment. The body needs the free air, the sunshine, the sense of freedom, and the contact with nature which give buoyancy to thought and feeling. Lacking these, the system droops and languishes; freshness and elasticity of body and mind disappear, and the happy life dies out unaccountably. The woman who would eat well, digest well, sleep well, laugh well, be blessed with sound nerves, and be able to fill her life and home with perpetual sunshine, must walk out every day. All her domestic arrangements should be made to meet that duty; husband and children should conspire to secure her that blessing; if the distance be but forty yards, it should be walked every day, and no weather but the most severe and no hindrance but the most insurmountable should deprive her of that right.

Like many other really good things, this one of walking is in great danger of being overdone. Some physicians have taken hold of it as their "hobby," and now drive it and their patients to extremes. A four or five miles walk every day, has become the "fashionable" prescription in sundry quarters. Women who had not for years walked a mile in a month, have been directed to go one or two miles before breakfast, and twice that number after. Medication they profess to drop,—though we still notice that they "drop" their aconite, chloral, and other poisons into the patient's stomach. Day by day they cry walk, walk, walk; and young and old, firm and delicate, elastic and drooping, are put upon the same prescription. It has become a matter of emulation among walking ladies in cities, to note who can walk the greatest number of miles per day.

A few years ago, one eminent professor in this city rode the

hobby of bromide potassium for every ill, till his patients took to dropping down dead suddenly. He then quit that, and jumped upon another hobby-horse,—experimenting with people by plunging needles one or two inches into the brain, and then passing a current of electricity through. His own profession scorned him for such brutality, not to say criminality; and now he is on the “walkist” horse, and bids fair to have some of his patients trot themselves into the grave.

Walking is a grand good thing, but when carried to extremes it is simply and actively exhaustive. One not accustomed to it, will feel better under this regimen for a time; but so soon as the accumulated wastes of indolence have been walked off and a larger percentage of repair is demanded, women will weary and fail under it. The physician who directs the continuance of five or seven miles walking a day, either does not understand physiology or has a sadly unbalanced judgment.

CHAPTER XXX.

ON TAKING AND BREAKING COLDS.

In the fall and winter months colds are abundant, and almost everybody “takes” them so easily that they do not often know how they got them. Women and children house themselves up, and scarcely get a sniff of out-door air; and yet find they will catch cold, or that cold will catch them. If the conditions are supplied, it is almost as easy to get a cold in the house as out of it, and to my plain judgment it is often easier. For myself, if the air of the room gets a little too warm and too dry, it starts me sneezing at once; and I think it more weakening to the lining of the air-passages to keep a room too hot, than it is to be moving about out of doors even in rough weather.

Colds are not taken when people are moving and have their blood in good action, but come when they sit down or stand still in some cool place. I never have seen any one who got a cold while walking or working hard enough to keep warm. But when they get warm, and then stop in a draft, or go into a cold place and sit down, or manage in some way to cool off too quickly, then they suffer. That is why people who stay so much in-doors, take cold

so much easier than those who are out a great deal. They get the skin warm and soft, and then a very little exposure chills them. Going from warm to cold apartments will set them sneezing, or from a heated living-room to a bed-room not heated. They may get a cold of that kind every week, or every day; and may get a much worse one without stirring from the house, and still wonder how it was taken.

It is a mistake to suppose that the changes of the weather are not felt in the house. The nerves and skin of sedentary people get more sensitive than those who go much abroad, and very slight changes are felt by them. And if they heat by furnaces or by tight stoves, it is so much the worse for them. They feel a change of weather before it comes, almost; and are sniffing and sneezing and coughing before other people are aware that the thermometer has gone down.

My opinion is just this, that people need seldom take severe colds. They come by folly and grow by neglect, and nothing is needed but good common-sense to prevent them. A lady of my acquaintance, living in a city, last winter took it into her head to do some house-cleaning during the mild weather we had early in January. She thought her windows must be washed and polished; and this she did, sitting on the sills to clean the outside, not "minding" the draft that chilled half her body. Friends warned her against this, but she laughed at their fears, and a pneumonia that nearly cost her her life was the price she paid for her un-wisdom.

Now anyone ought to know better than do such a thing. But in the sitting-room of country homes I have often seen a stove with a sheet-iron top, that would heat up to the blazing point in a few minutes, and put the occupants all in a fever-heat. In half an hour the fire was down, and the stove and the room were cool, and the family was ready to feel chilly. A fresh firing repeated this process, ending in discomfort and sneezing to them all. Or the heat would dry the lungs and open the pores in perspiration, and a few minutes in a cool room or out-doors would be sure to cause catarrh.

I knew a lovely young woman in fashionable life, active and intelligent, who in winter would insist on going to the front door with her friends as they took their leave. Remonstrance was of no avail. One day she had an unusual number of callers. The house was warm with furnace heat, and her vivacity kept her in

a glow. As each friend left, she would see them to the door and for a few minutes stand in the cold draft, coming back to the sitting-room with a shiver. Late that evening her shivering became a prolonged chill, the doctor was summoned before morning, and in one week she was carried to her grave.

A gentleman who was a book-keeper, and in the office most of his time, one winter day went out on some business that caused rapid walking for some distance. It was a mild winter day, with a brisk wind blowing. Just as he turned a corner he met a friend, and stood in the breeze talking for about ten minutes. His walk had caused a pretty warm circulation, but his stop on the street chilled him, and he was kept in his house for many weeks with inflammatory rheumatism.

Such imprudences we meet by the score. Some are glaring, others are trifling; but they serve to chill the body suddenly, and colds are the result. If necessity compel such things, the next best to do is to break up the cold when it is new and has not settled. Nothing is easier; and the severest cold that ever was taken may be nipped in the bud with but very little difficulty. Just warm the room pretty well, place a vessel of water over the fire so as to get a slight moisture in the air, and put the feet in a deep vessel of hot water, and start a free perspiration by drinking any warm sweating tea,—ginger, sage, lemonade, or anything. It is just that simple to end a cold, if you do it at the start. The danger comes by waiting; and one or two hours allowed to go by in chilliness, may depress the system so that to rally it will be very hard indeed.

CHAPTER XXXI.

SOME THOUGHTS ON CONSUMPTION.

EVERYBODY dreads consumption, except the pale and dainty people who are most subject to it; and they can never be convinced that there is any danger in their case.

A great many false ideas prevail among the people as to the nature and proper management of this insidious malady. At all times extremely dangerous, it is made far more so by the improper course of those who are liable to it, or in whom it is developing or has developed. Sanitary regulations will do far more to prevent

consumption, than the wisest medication can to cure it. And one of the chief means of prevention, as well as of cure, is to pursue that mode of living which will ensure good appetite and equable digestion. The malady is essentially one of poor nutrition, in which the ill-prepared aliment does not get fully vitalized in its passage to the blood and the left side of the heart. It then gets caught in the fine meshes of the lung tissue, is there deposited in little points of a half-cheesy character; and these cause irritation, provoke a cough, and finally soften and break down the delicate tissues so as to be cast out as yellowish expectoration.

Most people imagine there is no danger unless they have a severe cough, and that they will get well if they can only stop the cough. And too many doctors know little more on the subject than the people themselves; and they tax their genius to invent some profusely expectorant cough syrup, every dose of which relaxes and half nauseates the stomach,—thereby interfering still further with digestion, and rushing into the lungs increased volumes of material for the lungs to decay, while pumping out by the relaxed lung a little of what has already decayed. Loosening cough syrups, as commonly made, play sad mischief with consumption.

Maintain good tone in the stomach by a generous diet, easy of digestion, plainly cooked. Keep the digestive powers to their full vigor by moderate out-door exercise every day. Perfect the vitalization of the nourishing elements by the action of sunshine, pure air, and free action of the lungs. Avoid all sources of lung irritation, as found in exposures, dust, tight clothing, dampness, etc. Such rules and observances would greatly delay the progress of even hopeless cases, and would surely prevent the development of many which threaten.

But most people of consumptive tendencies pursue a course exactly the opposite of this. They shut themselves too much indoors, and keep themselves heated by stoves and furnaces, for fear of taking cold. Such a life only opens the pores and increases the liability to colds; and it also entails so little exertion that the appetite becomes dainty, plain fare is unpalatable while fancy indigestibles are picked at, and the ability of working food into good nourishment is greatly reduced. An out-door life and a reasonable share of “roughing it,” will prove the best of appetizers and blood-makers; and people who almost live out of doors, and care nothing for the roughest weather except to keep dry and not stand

in draughts, are the people who contract fewest colds. Of course no one should try to toughen themselves by going scantily clothed or getting chilled, for that is but little short of suicide.

Thin clothing, damp feet, darkened rooms, and confined air, are very bad for consumptives. So is a house shaded closely by trees which render it dark and damp. Cut down the trees so as to let the sun freely into every room some part of the day. Thin out the trees so as to let the sun freely among them. Keep open windows summer and winter, night and day, yet so as not to sleep in a direct draft. Have a house raised well above the surrounding earth, and with a cellar absolutely dry and well ventilated. Get out of a damp or dark valley position unless you are prepared to order your coffin. Observe these regulations with common-sense, and begin them before it is *too late*, and you are likely to build up a state of health that will bid defiance to consumption.

PART II.—DISEASES.

CHAPTER I.

DEVELOPMENT AND CAUSES OF DISEASE.

A DISEASE may develop and run its course rapidly, terminating in recovery or death in a few days or weeks. Such a disease is called *acute*, among which are all fevers and many other troubles with more or less violent symptoms.

Other diseases develop slowly and have a prolonged course, usually with less violent symptoms than are common in acute diseases. These are called *chronic*. A chronic disease is always connected with some distinct alteration and lowered vital tone in the structures; and when such changes have taken place gradually through many months or years, they can be restored to their natural conditions only by persevering and long-continued management with all the arts of hygiene and with suitable remedies.

Acute diseases show much more active disturbances of the functions, and may be relieved and cured more quickly on that account. But some severe acute diseases may also change the structures, or lead to their partial destruction; and then chronic forms of disease will follow the acute one.

Very few diseases result directly from a single cause; and these are mostly contagious maladies, such as small-pox, scarlet fever, and measles. Malarial diseases also follow a specific cause (p. 72); and pneumonia, bronchitis and pleurisy are due to direct exposure to cold. But the great majority of diseases are caused by a combination of influences, some preceding and preparing the way for others, all co-operating in reducing the strength of the frame until it finally succumbs. Such combinations of causes are really innumerable, each having a share in the damaging work and giving more or less diversity in the disease it helps to provoke.

It is the usual custom to look for one particular cause of a disease; and then to conclude that the disease will come to an end if the cause is removed. This is true only in very small part. One

potent cause continuing to operate, will make it very difficult to cure some diseases,—as seen in the recurrence of ague and other malarial troubles on people living in marshy districts. But another cause may be violent and then totally cease,—as a fall, or collision with a locomotive, or certain infections,—and yet the result of its action be long-continued. It is most proper to estimate each influencing circumstance at its own value, and to consider that a number of them conspire to bring about an attack of disease. Even in the case of the specific contagions, it is a common fact that a person in full health, and living in all respects according to the rules of good hygiene, may be exposed to the contagion again and again without contracting the disease. But that same person may at another time be wearied with labor, anxiety, loss of sleep; suffering from improper diet for several days, or a bad atmosphere, or the bad influence of chilliness and wet feet; and then even a brief exposure to that contagion will cause him to succumb to it.

A few facts in common experience will serve to illustrate the manner in which several causes conspire to bring about disease. A person in good health, for example, may be exposed to cold, wet and inclement weather, without feeling any material inconvenience therefrom. But if one is thus exposed who is not in good health, or is feeble from some previous disease, he may be wholly unable to resist the chilling influence of the weather, and suffer inconvenience or disease in consequence. What was a mere trifle, or possibly an invigorating pleasure, to the hearty man, induces chilliness, discomfort, or a spell of real sickness, in the feeble man; and the more decidedly so, if steps are not taken promptly to restore the circulation that has been driven from the surface by the exposure (p. 153).

The particular form of disease resulting from such chilling of the surface, will in large measure be determined by the previous habits and condition of the person. The general rule is, that the organs which are weakest from prior disease, or from bad hygiene, will be least able to resist the recession of blood from those organs engorging and obstructing them and disturbing their functions. Thus: If a course of improper and too hasty eating had irritated the stomach and bowels, and weakened these organs; then incrowding blood will be likely to fall chiefly upon them, and painful diarrhœa, or inflamed bowels, or dysentery may follow. If the person suffering the exposure has small and delicate lungs, or has been most of his time in rooms too hot and imperfectly ventilated,

the blood is quite sure to rush from the surface to the chest; and there may result bronchitis, or pleurisy, or pneumonia. One belonging to a rheumatic family is in danger of having rheumatism follow such an exposure; while another, not constitutionally inclined to this disease, may wholly escape it under prolonged exposure, and suffer a liver trouble because of a bilious temperament (p. 104) and the previous use of too much fatty food; while yet another may escape both these, and be in danger of some kidney disease because of a custom of drinking beer or indulging too much in lean meats.

In all persons, the indulgence in too much and too concentrated or too fatty articles of food will sooner or later weary the digestive organs and weaken the digestive power. For a considerable time, such violations of good hygiene may not seem to be any detriment; and some persons follow daily surfeiting and luxurious fattening with such apparent impunity, that they really imagine they are not hurt in the least by what their judgment would quickly discover to be a source of mischief in others. But presently some unusual or indigestible article is eaten in quite small quantity,—not enough in amount or kind to make other than a passing impression upon a really healthful stomach. But to those persistently over-taxed organs, this trifling is the balance-tipping “last ounce.” The stomach and intestinal digestive glands (p. 124) have already done all the work they can be forced to, and they sink under the added task. Distress of that woeful kind known as “a fit of indigestion,” may follow the few trifling mouthfuls; or gastralgia, or severe nausea with vomiting, or possibly inflammation of the stomach. In warm weather, a dangerous diarrhoea or cholera morbus may result; in a malarial district, bilious and dangerous dysentery, or bilious fever, or congestive chill, might ensue as a consequence of what seemed to be a trifle, but which was as a spark in a powder magazine.

Chronic diseases are developed more slowly than the acute ones, and the combination of influences that leads up to them is often multiform and insidious, operating gradually and almost imperceptibly. Such causes may continue for years without fully asserting their baneful effects; and they may also be combated by a good constitution, and by various favorable surroundings, until it would seem that they ceased to be injurious and that no harm from them need to be feared. Yet ill habits and unsanitary conditions

will continue their mischievous work, until finally their evil power asserts itself in a way and manner that are often disastrous.

For example: The use of tobacco may so far be resisted by a good constitution, and correctness in all other habits, that one comes to flatter himself that the weed is entirely harmless to *him*. But improprieties in eating weaken the stomach and liver; sedentary habits help on indigestion; and perhaps close application to study or business keeps the entire nervous system excited and wearied. To such a combination of circumstances add the use of tobacco for some years; and the results will probably be dyspepsia, habitual constipation, variable seasons of mental irritability and depression, and at last a general lack of vigor and of endurance. Such persons begin to decline prematurely, and may be considered fortunate if they do not have forced upon their poor stomach and nerves an appetite for strong drink. As age grows upon them they are unfitted for the demands of active business; are wasted with the torments of indigestion, or (if of the lymphatic temperament) are prostrated with chronic liver troubles and dropsical tendencies; and a reverse in business may break them down under a sudden apoplexy, or a fatal heart disease suddenly carry them away,—when no such affection had previously been noticed, and never would have existed except as the combination of tobacco with the other improper habits weakened the heart and its blood-vessels and sapped the nervous energies.

In many similar ways it is usually the fact that several causes lie at the basis of most diseases. If a solitary cause is looked for, it may not always be found; or sometimes a single cause is considered to be the producer of trouble, while several co-operating influences are over-looked and remain without correction. In order properly to understand the true situation, and to adopt those measures of hygiene that are sometimes much more important than the wisest use of medicines, every possible cause of degeneration in health must be searched out and removed. Once in treating a hired girl in an excellent family, where the work was easy and the house admirably situated on the hills near this city, I failed to give suitable relief to muscular pains and a feeling of general lassitude which clung to her. Despite my every effort, she steadily lost ground without the development of any particular disease in explanation. Inquiries into habits, state of mind, etc., failed to reveal any adequate cause for her condition. At last I ascertained that she did her washing and ironing in a basement

room that was insufficiently lighted and ventilated, and this by a couple of small windows on one side of the room. The family at once changed a state of affairs that they had innocently supposed to be an admirable household arrangement; and in a short time the girl improved, and soon regained her health. I am satisfied that a continuation in that laundry would soon have developed consumption.

Men are prone to riding hobbies on this as on many other subjects. They are disposed to look upon one or two influences as the prime factors in causing all diseases, and then to pass by all the other influences that may co-operate with those factors, or may be altogether more at fault. One inveighs against the use of tea and coffee, as if all the ills of life—physical, mental, and moral—had their origin in these table luxuries. Another attributes ill health almost exclusively to rich food, though he himself may be violating the laws of physiology by rapid eating—washing down his unmasticated food by great draughts of cold water. One refers almost every disease to malaria; while another, living in a non-malarial section and scarcely ever seeing maladies of this kind, scouts the idea of such a poison and charges the liver, or indolence, or tobacco, with being the mainspring of all diseases. Such hobbyizings are usually great mistakes. Give each cause its proper share of blame, and no more. Bear in mind that one or several bad habits may act slowly as predisposing causes of many diseases. By doing this, the full value of the rules of hygiene, as discussed in the first part of this volume, will be appreciated, both in their value for preventing disease and in their power of promoting a cure when properly obeyed.

Such facts also have an important bearing upon the course of many acute and chronic diseases. Where the habits and modes of life are correct and according to the laws of hygiene, any disease contracted will be of milder type and hold out more prospects of recovery than when the life has been a series of hygienic violations. When the laws of life have been persistently broken, even though at the time these infractions seemed to produce no evil results, the onset of disease will find the resistive powers of the system reduced thereby; and then the disease will be more severe in its characters, more protracted in its course, and more dangerous to life than it otherwise would have been. Breathing impure air, drinking impure water, living in rooms and occupying offices deficient in sunlight, and other modes of disobeying the laws of

health, may be pursued for years, gradually thining the blood and sapping the energies of life. Presently such persons meet with an accident, or an exposure, and go down under the shock; or an epidemic appears, and finds its most numerous victims among them. Every physician, in considering the probabilities of recovery in a very sick patient, estimates the extent to which all such abuses of the system have conspired to help develop the disease or to lower its power of recuperation.

While sanitary science has been advancing, and the general laws of hygiene are much better understood and more closely followed by the people than ever before; it is patent to all careful observers that the types of most diseases in these days are marked by greater feebleness and debility than formerly. Robust vital resistance to disease is not the rule; and there is an increased proportion of cases in which there is marked prostration from the first, and in which recovery is delayed or interrupted by complications. Constitutional diseases are also multiplied, and evidences of degenerating vitality in many sections are on the increase. Sudden deaths are also more numerous than in times past; and although the average of a human generation has been lengthened (p. 20), it is a lamentable fact that constitutional vigor is on the decline among large masses of people, who can not endure the fatigues and hardships of the past.

When we look for the reason of this, we find that the general vigor of the heart and of the nervous system is less now than it was formerly. And this loss of vigor in these great life centers is in turn due to a combination of influences affecting masses of people, just as particular diseases result from a combination of influences affecting the individual. Among these causes are included (1.) The protracted heat of our American summers,—long-continued heat of a degree above 85 being peculiarly wearying to the nervous system. (2.) The habits of life that have grown upon us as a people; the forcing modes of getting an education, doing business, conducting society, and doing everything (CHAP. XXI), making exhaustive demands upon the nervous system and reducing its stock of vigor. Dr. Pollitzer, of Vienna, remarks upon the extent to which the nervous system is involved in the diseases of the present generation, attributing the fact to the “constant stretch of mental powers, the restless excitement of the passions,” which mark this age. The study and competitive examinations at schools and colleges, put upon growing youth as great a strain as

would formerly have been deemed sufficient for strong adults. The late hours, the exciting amusements, the luxuries of modern civilization in cities, all conspire to make early shipwreck of the nervous system,—and with it of digestion, nutrition, and the general vigor of bodily repair. In such ways this great center of life is impaired at the very outset of existence,—the nervous organization being too often received from the mother in an unbalanced condition, and then unhinged or partially shattered by the customs under which such children are reared.

But many other influences have long been, and still are, at work promoting degeneration of the nervous system. Prominent among these is the almost universal addiction to the use of tobacco,—a habit saturating a man with uncleanness, slowly but surely undermining the heart power and the sensory functions in nations, transmitting from the father a delicate frame, and a perverted appetite that painfully exhibits itself in the use of the cigar and the cigarette by boys scarcely beyond the years of infancy. A father who can thus indulge his own perverted appetite without self restraint, and clearly at the cost of his children's constitution, is remarkably inconsiderate of the future of his own offspring. And although that tobacco-using father may flatter himself that the use of that narcotic has in no wise affected him, every intelligent physician knows that many acute diseases offer an unpromising outcome to men of otherwise good constitution who have saturated themselves and weakened the nervous system by the use of that article.

The use of alcoholic drinks, which has become so appalling in our nation in the last half century, is another great source of physical degeneracy among us. Under this head I make no distinction between malt and spirituous liquors, for they are both used on account of the alcohol they contain; and their action is very similar in kind, though differing more or less in degree. This action is more or less rapidly narcotic,—as witnessed in the notable mental dullness or half stupor of the extensive beer-drinker, and the state of dead drunkenness induced by stronger articles. A fit of delirium tremens illustrates the terrible shattering of the nerves produced by a debauch, and toward which trembling and “shakiness” every smaller portion of strong drink is always tending. The degenerating consequences of using alcohol, even in great moderation, are painfully visible at the sick-bed,—where the tippler is often deprived of hope and of life as the result of this

habit, and this in maladies that otherwise would be cured with ease. An extended examination into the true effects of alcohol and tobacco will be given in the third part of this volume.

To these causes of general nervous degeneracy are to be added the debilitating effects of opium and other narcotics, which have come to be used in enormous quantities in and out of the medical profession. The effects of all the narcotics,—opium, morphine, belladonna, chloral, etc.,—are invariably damaging to the nervous system. Of whatever grade they may be, or in whatever quantity taken, they one and all blunt the true function of the nerves and tend to paralyze the nervous system. Though many good men imagine it is impossible to treat human suffering and prolonged wakefulness without such articles, I am abundantly convinced that they are mistaken. I have practiced my profession for more than thirty-seven years; and I *know* that no narcotic is a necessity, and that the dangers of their use is so much greater than any seeming benefit ever obtained from them, that those dangers can not be measured.

A recent writer, who had been addicted to the use of opium, briefly sums up its effects as follows: "The opium eater is disinclined to, and in some sort incapacitated for, bodily exertion. He feels a sense of bodily fatigue; to walk up a flight of stairs often tires his legs and makes him pant. His lungs are manifestly obstructed, his liver is torpid, or but partially active, he is more or less costive, all sexual desires are lost, and there is annoying palpitation of the heart." (*Opium Habit*, p. 219.) The unsteady nerves, the wasted frame, mental disturbances, and actual insanity caused by this drug and the morphine preparations obtained from it, are simply appalling. Dr. Aitken, a leading medical authority of England, says it "suspends the power of transmitting the nervous force so long as the influence of the poison lasts." And upon the use of it as a hypodermic injection, the same learned gentleman says: "Its use is attended with similar bad results as the taking of opium in any other form. The dose must be gradually increased, and the remedy cannot be given up. If it is omitted, the patient feels dull, weak, uncomfortable, nervous; and trembles from head to foot, as after an alcoholic debauch." (*Practice of Medicine*, vol. II, p. 167.)

It is not my purpose here to adduce testimony upon the deleterious results of giving poisons as medicines. Volumes of evidence are at command; but they may be summed up, for our

present purpose, by the definition of poisons, given many years ago by a writer in the Boston Medical Journal. He defined them all, from the weakest to the strongest, as articles "which suddenly and rapidly extinguish a large portion of the vitality of the system." Of course, if the dose is sufficiently large, too much vitality is thereby extinguished, and the life goes out. If the dose is small, even if it is very small, it extinguishes vitality so far as it goes; and a repetition of minute portions of any poison cannot fail to be a damage to the frame, to weaken its resistive powers, and to increase the dangers of any disease. It is my firm belief that no poison of any kind or form whatever is a proper thing to give to any man, sick or well. Such articles are among the most direct influences that can weaken the system and foster the development of disease; and thousands of the best educated physicians are of the same opinion, and are laboring to hasten the day when all such articles will be banished from the lists of medicines. It is my purpose to preserve and assist vitality—not in any degree to help "extinguish" it; hence I prescribe no poisons of any kind in this book, and have briefly pointed out the fact that their use is to be counted among the combinations of causes of disease.

CHAPTER II.

SOME RULES FOR TREATING DISEASE.

IN treating any form of disease, it should always be borne in mind that medicine can only assist the Life Principle in regaining its full control over all parts of the body (p. 12). Disease is a measure of departure from such vital control; and the changed conditions of the diseased organs cause disturbances and obstructions in the performance of their functions. Medicines are useful in proportion as they help to restore the organs to their natural and healthy state; and when this has been accomplished, the functions that were disturbed will again be performed in their proper manner.

Hygienic regulations are more important than medicine. Such regulations provide the normal conditions of life, and no disease should be allowed to continue, nor any attempt be made toward its management, without so adjusting all the surroundings as to

supply every condition necessary to health. When this has been done, the use of proper medicines will be much more effectual than would be possible otherwise; and when the best and wisest medication has done all it can, the ultimate restoration of strength to the convalescent depends upon air, sunlight, suitable food, cheerfulness and other sanitary provisions. The details of these matters as they affect the sick, will be given at another place in connection with Nursing.

In acute cases, medicines need to be given at shorter intervals and in larger quantities than in most chronic cases. In chronic diseases, the structures have altered their conditions so slowly, and to so considerable a degree, that it may require months or possibly years to restore them to their natural state and action. Medicines that act quickly and through the system generally, are those most to be depended on in acute cases; but those of slower action and affecting the especial organs are chiefly used in chronic cases.

The skin, the bloodvessels, and other organs that act with great rapidity, generally are best influenced by remedies that act quickly and diffusively; and these may be further hastened in their action by being given as warm infusions. Slowly acting organs, like the liver, want agents that act slowly; and these should be given at long intervals;—usually once in three to four hours for the kidneys, four to eight hours for the bowels, twelve to twenty-four hours for the liver. More diffusive medicines may be given every hour or less in acute cases; while every three to six hours is usually often enough for any kind of medicine in chronic cases.

Medicines for the liver and the skin should never be mixed together; nor those for the kidneys and skin; nor those for the liver and the kidneys. Always keep such classes of medicines separate from each other; and do not give them too closely to one another, even in acute cases. The stomach will tire and revolt if too many kinds of medicine are crowded one upon the other.

The amounts given should be aimed at securing a natural action of the parts. It is of the first importance, in every case, to attend to every secreting organ that may be obstructed or defective in performing its duties. Unless they are sustained in removing the waste elements from the body, disease cannot be overcome (p. 165). Each of these organs must be brought to the proper discharge of its function, with a moderate excess in acute cases to remove what has accumulated by its torpidity. But no secreting organ must be hurried and driven to a large excess of duty above

that which is natural. It is always weakening, and therefore improper, to force the bowels to excessive catharsis, the liver to excessive discharges of bile, the kidneys to excessive urination, and the skin to dripping perspiration. It is common to work up such extremes, but it is not a proper course.

Frequently is it the fact that disturbances of the circulation cannot be remedied, a fever lowered, cold hands and feet relieved, or the skin brought to reasonable perspiration, till obstructions in the liver and smaller bowels have been overcome. In like manner it may be impossible to relieve disturbances of the nervous system, to abate pain or overcome mental despondency, without first removing the ill conditions of these central organs. And in acute cases, as also in many chronic ones, it is useless to attempt to restore strength by the use of tonics, so long as the liver and upper bowels remain inactive and loaded with foul accumulations.

Medicines are to be continued so long as the system has need of them. The purely sanitary remedies that I advise will never do harm by their use, if the system is in condition to require them. And the amounts may be increased until they effect what they are designed for, in some persons and cases to several times more than I name; for in themselves they are harmless, and will not damage any tissue, nor cause disease, nor endanger the constitution of even the most delicate person. When they have begun the accomplishment of their work, they may be withdrawn gradually, and discontinued altogether so soon as the system can do without their help. It is not desirable to change from one medicine to another too frequently in acute cases, but to persist and increase the use of those that are plainly suitable. In chronic cases, it is usually best to change to others of the same general kind every few weeks or months.

A sick person should not be awakened to take either medicine or food, except under the very few circumstances where the sleep is so prolonged as to leave a chance for loss from lack of nourishment or necessary medicine. Sleep is the great refreshener of the system; and is, as a decided rule, more important to the sick than anything that can be given to them.

And here it may be remarked that the signs of real disease cannot be met too promptly. It is needless to follow every little uneasiness and ache by rushing to the medicine box; but nothing can be more disastrous than to delay using the most vigorous measures to break up any threatenings of actual disease. A few

hours lost by such delay,—as in a severe chill, or sudden lassitude, or threatened bronchitis, or signs of croup,—may allow such rapid advances of disease as may lead to a protracted sickness or actually endanger life; but such troubles should be overcome promptly, while they are yet but trifles.

CHAPTER III.

GOOD AND BAD SIGNS IN SICKNESS.

ANY person waiting upon the sick is always anxious to know what progress the patient is making, and whether the symptoms are favorable or discouraging. This is to be estimated by taking a number of signs into account, and not often by any one sign alone. Each disease will give some particular evidence that belongs to itself, yet there are some signs that belong more or less in common to all diseases.

In all estimates of the prospects of a sick person, it is first advisable to consider his age, and then his constitution. A child under five years has not much enduring capacity, and under two years this capacity is still less. One advancing far in life, as beyond 60 or 65, has begun to lose the force of middle life, and cannot resist disease as before. When the original constitution was poor, and the frame delicate, and some degenerative form of disease has been hereditary in the family, that person has reduced powers of resistance. On the other hand, those of robust constitution, firm build, and free from hereditary taints, have such great resistive power that many times they will recover under circumstances that seem hopeless. It was of such constitutions that Sir John Forbes wrote, after half a century of medical experience: "This natural curative power is not one that operates merely occasionally or feebly, but one that is always present, always active, and possessed of sufficient force to cure the great majority of diseases without any extraneous assistance." (*Nature and Art*, p. 37). And of such a constitution Dr. Chambers said: "Mark the vigor of renewal with which the human body is dowered. Learn from this to have faith in its power, though prospects may look unto-ward." (*Renewal of Life*, p. 614).

It is in this connection that the previous habits of a person as-

sert themselves either for or against him. If he has been a prudent and sober man, living evenly, addicted to no bad practices, not subject to severe exposures, a plain and moderate eater, and not accustomed to either mental or physical strain, he will in sickness have a large fund of reserve vitality with which to overcome disease and re-establish health (p. 179). With such a man, good nursing and suitable medication have a basis to work upon and with, and may hope to accomplish much. But if one has been imprudent in his methods, a heavy and rich eater, rash in exposures, habitually overstraining or lapsing into indolence, addicted to the use of tobacco, accustomed to the use of beer or ardent spirits, and most particularly if tainted with constitutional syphilis or with mercury, his reserve vitality has already been pretty much exhausted and he is so far on the road to physiological bankruptcy that his chances under severe disease are small.

Nowhere will habits of using alcoholic drinks tell so forcibly against a man, as when he is brought to his bed by accident or disease. Although I have spoken freely on this point elsewhere (p. 229), it is of so much importance as to call for another mention right here. A long course of very moderate tippling, even in a robust man who never was known to be drunk and who prided himself on having always been temperate, will militate against him in his days of sickness. If he has been accustomed to a larger use of strong drink, the damaging fact will now show all the more plainly, and may determine the fate of a strong man in middle or slightly advanced life. Even the malt liquors, so much praised for their "strengthening" effects, will now show how damaging they are to the constitution and how decidedly they lower the vital tone of a man. The very flesh they are so boastfully said to create, now proves to be mere slush and a burden to the struggling body. Living in a city where beer is almost worshipped, my profession has given me long years of experience in its damages; and that experience points to the fact that a regular beer-drinker will lie down and helplessly and suddenly die under diseases of a grade where other men would not be in danger for an hour. No wonder that Insurance Companies of solid business habits reject the applications of habitual beer-drinkers as well as tipplers. Total abstinence is at a grand premium, when men come to the sick-bed.

Among other facts that reduce one's resistive capacity, the following deserve especial mention: Long-continued mental distress or anxiety,—as in business, domestic losses, love affairs;

sexual excesses, and this whether in wedlock or out of it; insufficient or impoverishing diet; too frequent pregnancies; the cultivation of a melancholy disposition.

On the other hand, the following circumstances improve or favor one's resistive capacity: A cheerful disposition and cheerful company; freedom from mental worry and anxiety; a previous general observance of the laws of hygiene; a distinct self-restraint in married life.

In acute diseases, the following are among the favorable signs: A gradual clearing and moistening of the tongue; gradual re-appearance of perspiration, of discharges of bile when the bowels have been costive, and an increase of urine (which at first may be muddy); quiet sleep, with the eyes closed and the breathing gentle; a pulse reducing in frequency when it has been very high, at the same time becoming fuller and more elastic. Generally these several evidences of improvement will follow each other closely in fevers and other acute maladies. Restored secretions are always of favorable import, as they carry out from the system large quantities of waste materials that had been damaging it (p. 165.) It is not at all uncommon for such restored secretions to be rather excessive for a time, the perspiration being abundant, the bowels moving three or four times in twenty-four hours, the discharges, perhaps, being very offensive, etc. This is usually to be attributed to the fact that waste material has accumulated, and now pours out abundantly through the several channels. Such excesses in the discharges are not likely to continue long; and no anxiety need be felt, but quite the contrary when they are accompanied by quietude and a gradually improving pulse. But if such excessive evacuations are associated with increased restlessness, a smaller and more frequent pulse, and a pale and sunken countenance, they are not true secretions, but colliquative (exhausting) discharges, and are often of great seriousness.

Among the unpromising signs in acute diseases are these: A very small pulse rising above 120 per minute in the adult, continuous restlessness, a very dry tongue turning dark or brown, tongue trembling and put forward with difficulty, the sudden appearance of yellowness on the skin, sleeping with the eyes partially open. Of the truly dangerous signs, the following are most common: Pulse gradually disappearing at the wrist, drenching perspiration, involuntary and watery discharges from the bowels, lying persistently on the back, sliding downward in the bed, pale and greatly

pinched countenance, great coldness of the lower extremities while the body and head are hot, squinting, hiccough, twitching of the tendons in the wrists, sudden cessation of pain without improvement of the pulse and countenance, stupor with struggling or snoring breathing.

CHAPTER IV.

THIN BLOOD, ANÆMIA, CHLOROSIS.

In early and middle life, the blood may become thin and impoverished from a variety of causes. Its red portions—the floating corpuscles that give it color—are reduced in number, and the watery parts are generally increased in quantity. As a result, the blood is less nourishing than it should be; and then all parts of the system lack power of vigorous action, and a prolonged state of this kind leads to general evidences of exhaustion and danger. The condition is technically called *anæmia*; but in girls about or soon after puberty, among whom it is common, it is generally known as *chlorosis* or *green sickness*.

Anæmia is the result of a variety of influences, all interfering with the blood-making powers of the system, or instituting too great a draft upon the system and then using up its blood-supply too rapidly. Among these causes may be enumerated the following, several of which may be more or less associated in many cases :

Derangements of the digestive functions that interfere with the conversion of aliment into blood. A perverted appetite, giving an unnatural desire to eat pickles, chalk, pencils, earth, and other strange articles, is common in this class among school-girls. Deficiency of suitable food; deprivation of meats; prolonged dependence upon potatoes, rice, and other farinas; lack of light and air, which are necessities in the formation of blood (p. 30); an insufficient amount of out-door muscular exercise, as in the sedentary life of seamstresses, clerks, merchants and students. Also neglected diseases of the glandular system; and affections of the heart and central blood-vessels, interfering with the general circulation. Prolonged exposure to certain poisons,—as residence in malarial districts, laboring in or living near lead or mercury works, working in green-colored artificial flowers and green wall-

papers, where arsenic is used,—steadily induces severe and dangerous forms of anaemia.

Rapid growth and development in early life, especially when associated with severe study or in-door occupations, when the nervous system is very active and the out-door exertions are not sufficient to preserve good appetite and digestion to supply the increased blood-demands of the growing and excited frame. Too frequent pregnancy and prolonged nursing. Profuse discharges, as excessive menstruation, large suppurations or abscesses, bleeding piles, severe catarrh, consumption, loss of blood from wounds. Similar in action is the loss of albuminous material from the blood in some maladies, as Bright's disease; and the constitutional taints that always impoverish the blood, such as from the use of calomel or other form of mercury, syphilis, cancer, etc. I may here also mention the slow wearying of the nervous system by prolonged excessive study in schools, which occurs for the most part at the very time when the nervous system is growing most rapidly and therefore needs the most rest, and when the sexual emotions are coming into force and need the most restraint. Men suffer this anaemic condition much less frequently than girls and women.

Symptoms.—The symptoms due to this condition come on rather insidiously, and generally are so interwoven with symptoms arising from the disturbance of some particular function, that the latter receives all the attention and the anaemic condition is overlooked. Prominent will be a pale countenance,—a fixed pallor overspreading the whole features, leaving the cheeks without color and making the very lips pale and at last colorless. This continues and extends with almost unvarying steadiness, except that a dusky hue tinges the eye-lids and the backs of the hands look browned. In girls at puberty this pallor has a waxy tone, and at last assumes even a greenish-yellow tinge. At the same time the skin is soft, satiny, and feels loose. A pearly blue tone is apparent in the "whites" of the eyes; the tongue looks leaden or pallid, and is often soft and shows the indentation of the teeth along its edges; and the mucous membrane under the eye-lids, in the mouth, and elsewhere, is pale and blanched.

With these evidences of thin blood will be muscular weakness and complaints of lost strength. Muscular force is diminished, an air of languor and want of vigor pervades every movement, there is an unwillingness to make any exertion, aches through the muscles are more or less frequent, and the person is fatigued by

quite ordinary efforts and is promptly condemned as being utterly lazy. Moderate exertion causes decided shortness of breath and palpitation of the heart; and advanced cases can not make any effort of the least consequence, without suffering rapid palpitation, dizziness, faintness, or actual faintings that are rallied from very slowly and may be immediately dangerous or even fatal. Cold hands and feet appear early, and increase and extend up the extremities. Constipation is almost invariably present, and is generally very obstinate. Headache is a common and early symptom, and after a time becomes fixed and nearly continuous in either the top of the head or (in malarial subjects) the forehead. Advanced cases give distress in the region of the heart on moderate exertion; visible pulsation in the blood-vessels of the neck; a small, soft, and exceedingly variable pulse at the wrist,—increased suddenly to rapid action by a trifling effort. Loss of flesh, with a flaccid feeling to the flesh, is present from an early date; but after an advanced stage has been reached, the eyelids become puffy, and dropsical conditions appear about the ankles and may extend up the limbs, over the whole face, and even the entire body.

Such appearances and feelings can not be mistaken. They are gradual in their growth, and may not get beyond a moderate degree of severity and continue at that level for an indefinite period of months or years. But they may get worse slowly, till the general health is undermined and the patient is in danger at any time of dying during a prolonged faint.

Along with these general symptoms will be various functional derangements, perhaps existing in some degree before the anæmia is particularly noticed, but getting more decided and troublesome as the thin state of the blood continues. Among these are the perversions of appetite already alluded to, dyspepsia, nausea, sickness in the morning or after eating, at last an almost total indifference to food. Menstruation is deranged, frequently painful, gradually losing quantity and color till it becomes very deficient and pale, or even suppressed, with pretty severe leucorrhœa as the rule. Excessive menstrual flow from miscarriage or injury may be a cause of anæmia, and then is liable to continue for some time and become very pale. Repeated nose-bleeding is common. Generally the urine is abundant, passed frequently, and very pale. A dull, depressed, drowsy, indifferent feeling is nearly constant.

Treatment.—Nothing could be more unwise than to pronounce these patients to be merely lazy, and then attempt to force them

to heavy exertions of which they are wholly incapable. Indolence sometimes contributes to bring about the indigestion and consequent bloodlessness, in-door life with darkened and ill-ventilated rooms contributes much more; but these comprise only a few causes, and the difficulty can not be remedied by forced exertions however much a suitable amount of exercise may benefit the patients when they get able by and by to take it without exhausting themselves.

Excessive menstruation, leucorrhœa, and similar female diseases are to be corrected as prescribed in my Woman's Book of Health. Nose-bleeding is treated of elsewhere in this volume. The possibility of conception must be avoided by married women, and mothers who are nursing babies must wean them. Children at school must discontinue their studies; and a change of climate or locality for a time is always an advantage to young or old. A sea-shore position is very desirable during the warm months; and lukewarm salt sponge baths may be given every second or third day to those who are not feeble. Girls at puberty must be stopped from reading sensational novels. Rest of mind and body is imperative, and must be prolonged,—only a moderate share of light household exercise being taken each day, the amount being regulated by the effect it has on the pulse and the breathing, and slowly increased as it can be borne. Bad cases cannot do anything at all.

An out-door life is a necessity to a full degree, and the in-door portion of life must be in rooms that receive the full sunshine and the freshest air. Food that is easily digested must be supplied freely, and must contain a full share of animal aliment, even though the patient seem disgusted at the very thought of taking animal food. Fresh lean beef, game, eggs, broths, etc., must be insisted on, cooked well in the simplest form, seasoned well, and eaten in moderate quantities. Better eat a little food every three or four hours. Protection of the cool surface by a reasonable increase of flannel or merino under-clothing is to be cared for; and light friction over the entire surface once or twice a day is desirable. Such measures must be pursued steadily and for a long time.

Medication is to be called in to aid this special course of hygiene, constipation and dyspepsia needing particular attention. For constipation, use the Butternut Syrup night and morning in large doses gradually diminished; or at bed-time a couple of the

Liver Pills; and in the morning, until the bowels get sufficient tone, give an injection of decoction of boneset with a little ginger. The Nervine Tonic is a suitable article to promote an appetite and strengthen the stomach, a teaspoonful or more of an infusion three times a day before eating. The Mother's Cordial is a very desirable article for the same purposes, one part of wahoo being added to it.

It is the general supposition that iron preparations must be given ere thin blood can be improved. I am fully convinced that is not a necessity; and yet am as well convinced that some of the non-poisonous iron compounds assist digestion in the intestines and thus promote the blood-making powers of the body. Tincture of iron is a dangerous preparation, though greatly praised; and I earnestly advise against its use. Soluble citrate of iron and potassa, and soluble tartrate of iron and potassa, are proper and useful preparations. I generally use ten grains of these in four ounces moderately strong infusion of golden seal, giving a small tablespoonful three times a day an hour and a half after eating; and the Mother's Cordial before eating. No iron can be put in an astringent; so it cannot be used *with* the Nervine Tonic nor the Mother's Cordial, as these both contain astringents.

CHAPTER V.

RICKETS.

THIS is a disease of children, very common and quite fatal in England and other parts of Europe among the poor; seldom seen in America, yet occasionally met in large cities in its milder forms. It is a disease of insufficient nutrition affecting the whole body, but most noticeable in the bony structures. It is the consequence of slow impairment of the nourishing processes, arising under insufficient and indigestible food, foul air, damp and dark rooms, aided more or less by lack of sunlight and cleanliness. A child thus situated is liable to show the ill effects of its surroundings at an early age; and the downward progress will become more rapid if constitutional feebleness, an attack of some acute disease, or unusually difficult dentition, first weaken the child.

Symptoms.—Usually occurring among small and spare children,

the symptoms begin with such digestive disturbances as occasional vomiting, and too frequent discharges from the bowels of loose, pasty and offensive materials. Profuse sweating of the face, head and neck when the child falls asleep, and persistent kicking off of the bed-clothing at night (even in cold weather) are soon noticed. Later on, if not soon arrested, the child becomes tender in its flesh and dislikes to be handled. Changes in the bones next begin, the ends of the long bones enlarging, the flat bones thickening, and all the bony structures getting softer and less firm.

Deformities of various characters gradually follow. The head looks enlarged, projected from before backward; the face is unnaturally small except that the forehead looks high; teething is delayed or arrested, and the teeth soon decay. Proceeding yet farther, the bones of the legs bend under the weight of the child and become crooked and twisted; the upper bones of the arms bend from muscular action; the weak ligaments of the spine allow it to curve, especially at a sharp angle backward; the ribs sink inward along the line of the breast-bone, thus throwing the breast-bone strongly forward. Deficient growth of bone stunts the child and makes him short for his age, he is rather a "backward" child as relates to growth and development, the abdomen is big and the muscles weak, and he is generally quiet though often rolling the head from side to side at night. Various degrees of enlargement occur in the liver, spleen and kidneys.

Such children, even in the partially developed stages, are exceedingly susceptible to colds and catarrhs, which with them become rapidly dangerous. The persistent inclination to looseness of the bowels often predisposes a slight cold to settle there and ends in serious diarrhoea. Nervous troubles, especially sudden convulsions, are easily excited; and while the child cuts his teeth very easily, he is quite liable to develop such nervous diseases during the teething period. Dropsy of the head occurs with some.

Treatment.—A malady that so insidiously tends to undermine the health and usefulness of the child, should be sought for in its earliest warnings, whether among the poor or the rich, and proper steps be taken to arrest its advances. "If an infant pass its ninth month without any appearance of a tooth; and its wrists enlarge, and if it is subject to head-sweats at night and to lie naked in its bed," rickets may be anticipated. Inability to stand when a year old, and loose joints and weak little limbs from that time onward,

strongly threaten the same outcome. Parents in good circumstances not unfrequently consider the malady as a species of disgrace, and attempt to conceal its existence; but it is no more a disgrace than is rheumatism or consumption, but needs prompt and judicious measures to avert future affliction.

As a first and constant necessity, such a child should be moved to a high, light, dry house, where every room should have plenty of sun. It must be taken out of doors daily, and for several hours each day; and restrained in its attempts at walking so as to avoid deformities. Daily bathing in *lukewarm* water (*never in cold*), good friction with the hand but little exposure to the air, warm dressing without overburdening, and a flannel bandage snugly drawn about the abdomen, are equally necessary. Sea-salt should be used in the bath twice a week,—a tablespoonful to the quart.

Careful regulation of the diet, so as to make it thoroughly nourishing yet easily digestible, is the next and equally positive requirement. If nine months or more old, the child should be weaned, as the mother's milk is probably too watery to afford it sufficient nourishment. Milk, to a gill of which is added ten grains of sugar and one-quarter of a teaspoonful of lime water, is a proper diet for the young. When about a year old, and from thence onward, other articles are to be introduced gradually, and in such small quantities as the child is found capable of digesting without provoking pain or increasing looseness of the bowels. Appetite may far outstrip the power of digestion, and disturbances of the bowels are sure evidence that too much food has been given, even though the mother thought the quantity was quite small and the child desired more. Light animal broths, the softly cooked yolk of egg, a raw yolk beaten up with milk, warm milk toast, and bread and butter, are the better articles to introduce with the use of milk. Some form of animal food thus constitutes the principal diet; and cream in the milk with a full share of good butter on the bread provide necessary elements. It is common to resort to farinaceous foods (p. 125); but they must be introduced cautiously, as they often disturb the bowels. A mealy potato baked or properly boiled, with butter or good beef-gravy, is one of the best articles of this class, giving at first a small quantity once in two or three days and watching the effect upon the bowels. Oatmeal is another, and perhaps the best for daily use (trimmed with rich milk) when the child is advancing

beyond fifteen or twenty months. Meats are to be introduced later on, a very little pounded mutton or beef being suitable. But arrowroot, sago, corn starch, and many of the "prepared foods" cannot be borne by these children, and should not be given.

Medicine is often useless to aid in regulating digestion. With the peculiar tendency to looseness of the bowels, a good course is to add a tablespoonful of tincture kino to a four ounce vial of Neutralizing Cordial, and give half a teaspoonful of this in a little water, to a child of eighteen months, an hour after each meal when needed, or oftener. Or equal parts of the Cordial and a syrup of wild cherry bark may be used in the same way, adding five to ten drops of lime water to each dose. As the child gets older and stronger, it may be given any mild vegetable tonic, such as the Nervine Tonic, in moderate doses. Sometimes the use of iron, as suggested in the chapter on anæmia, is advisable.

CHAPTER VI.

SCROFULA, STRUMA, TUBERCLE.

A LARGE variety of definitions has been given to the word, scrofula; and it is a state of the constitution that cannot well be described in a few set words. It exhibits itself in different ways in different persons; but in all cases it embraces an ill condition of the nutrient apparatus, and an imperfect preparation of the aliment, as a result of which the system of lymphatic glands is liable to obstruction. But other parts of the body may also suffer, there being a tendency to various swellings and ulcerations; and also to deposits of half prepared elements of nutrition in different places, leading to slow destruction of the parts. When such obstructions and decay take place, the tendency to repair them is feeble and protracted.

Swellings of the lymphatic glands—"kernels"—of the neck, jaws, arm-pits and groins, are among the commonest of these disturbances. These form small enlargements, varying in size from a pea to an egg; sometimes the smaller ones are several in number; they enlarge slowly and without pain or tenderness; rather firm to the feeling. Sometimes they remain for years, rising and

falling variously, and causing no inconvenience. At other times they may slightly inflame, and then slowly soften, and break into an open ulcer with a thin and rather excoriating discharge,—but this discharge may have various characters, as curdy, watery, viscid, yellowish, green, etc.

Similar slow ulcerations about the ears of children, or following an injury to the skin over the shin-bones, or in the bones themselves, are often of this scrofulous character. In the bones, the swelling stretches the tight membrane (*periosteum*) that covers every bone, and this causes a great amount of suffering until the membrane has opened and let out the matter that has formed under it. Slow softening and decay of the bones, of this nature, may go on for one, two, or more years,—causing much destruction in this dense structure, perhaps leading to deformity. Hip disease and white swelling are common instances of such scrofulous destruction of bones, generally started by some accident. Consumption in the lungs and bowels is, to say the least, first cousin to scrofula.

In all cases, the evidences of imperfect nutrition with such persons, when suffering from a scrofulous process of destruction, are quite apparent. There are poor appetite, poor digestion, pallor with some muddiness of the skin, a too bright flush on the cheeks of many, pearly tint to the eye-balls, lack of energy and strength, and slow loss of flesh.

The causes bringing about a scrofulous tendency are numerous. It is among the tendencies that may decidedly be inherited (p. 100), and this hereditary tendency may be lessened or intensified according to the relative constitution of the parents. With one class of these, the constitutional peculiarity is known by light-blue eyes, light hair, clear and thin skin, slender frame, drooping shoulders, narrow chest, precarious appetite, and limited powers of endurance. It is in this form that we most commonly see the scrofulous frame in America; and it may never develop actual trouble in such, or injudicious modes of living may develop trouble at any time. In Europe, another class of such constitutions is seen, giving a marked lymphatic temperament, thick and dusky skin, and general sluggishness yet perhaps great endurance. This form is liable to cause prolonged ulcers on the skin with swellings of the glands ; and was popularly called King's Evil, from a belief that a touch of the King would cure it.

One's mode of living has very much to do in developing scrof-

ulous troubles, and in provoking them into destructive action when there is a constitutional tendency toward them. Under this term are to be named improper habits, as relate to food, air, light, clothing and exercise. Thus: Persons living, or forced to live, upon thin, unwholesome and innutritious diet, are found to be peculiarly liable to scrofula. The poor, whose circumstances too frequently compel them to impoverish their system by eating such cheap articles as their penury can only afford, suffer more than the rich; persons confined by law on a low diet, soon exhibit evidences of struma; and restriction to a few articles of food, even of a good quality, will be found to impair assimilation and weaken the system by denying it some of the nutritive elements which are only to be had in an extensive variety of foods. All these causes are seen at work much more frequently in some European countries than in any portion of our own land. Impure air is a very prolific source of injury, directly impairing the lungs and denying the blood the amount of oxygen necessary for a full elaboration of nutritious materials at this point. Low, damp situations, inclement seasons and exposure to rains, are all found to be very detrimental to the assimilative functions, strongly inclining them to that debility which leads to the accumulation of scrofulous materials in the circulation. Deprivation of light evidently has a very strong influence in disabling the nutritive apparatus. Persons living in darkened rooms, in too closely shaded houses, in cellars and in dungeons, are found to be peculiarly liable to these developments. The influences of dampness and impure air are associated with the deficiency of light in the majority of instances. Yet numerous carefully conducted experiments, with rabbits, dogs and other animals, fully warrant the conclusion that this medium is of the greatest importance in maintaining vigorous assimilative action. The injurious influences of irregularities in clothing are not of so striking a character as the foregoing improprieties; but there can be no doubt that an insufficiency of covering weakens the whole digestive capacity; more, however, by the evils done thereby to the whole economy than by any direct bearing it may have upon these organs themselves. Want of exercise is a great bane and a fruitful promoter of scrofula, as may be familiarly seen in the great number of consumptives found among women, clerks and persons of like sedentary habits.

Wasting forms of disease. Under this head might be included a great variety of maladies, but as no one of these seems to have

a more special influence than the others, they may all be safely included in the general class of chronic or sub-acute affections which lead to general debility. In this connection may also be mentioned the continued use of alcoholic liquors and mercurials, the last of which is a most prolific source of weakened tissues. Excessive labor and exposures also favor scrofulous troubles in the poor and ill-fed.

MANAGEMENT.—The management of scrofula, in whatever form it may present itself, consists: 1st. In the adoption of that course of hygienic regulations which is best calculated to invigorate the faulty portions of the frame and enable them to furnish a more healthy and nutritive fluid. 2d. In the ejection (by aid of medication) of the degenerated substances floating through, and being deposited in, the various portions of the system.

A remembrance of the character of the influences which bring about that debility of the assimilating organs which leads to scrofula, will be found a sufficient reason for making hygiene the first, last and principal part of its management. It is but taking away the influences which lie at the foundation of the malady and substituting healthy and strengthening influences in their stead. The freshest air must be furnished, and dry, open and elevated situations chosen whenever practicable. All exposure to improper dampness and inclement weather must be avoided most sedulously; and the clothing must be regulated with great care, that the body may not at any time become chilled by sudden changes of temperature, or the heat too much abstracted by wearing wet apparel. All sedentary habits must be avoided as far as possible; and a regular course of gentle out-door exercise or employment enforced, as the patient thereby obtains the triple benefit of fresh air, light and an improvement of digestion. A regular system of bathing should also be observed, the water being employed at that temperature which proves most agreeable, and thorough reaction should be induced by the application of good friction after the baths.

Much difference of opinion exists upon the question of diet. Heretofore, and with a large class at the present time, animal food of a decidedly fatty character has been preferred,—pork, butter, cod-liver oil, each in turn, being lauded as peculiarly fattening for patients of this class. My own opinion, however, is decidedly in favor of an almost purely vegetable regimen, which, I think, presents nutritious elements to the system in a form that is much more usable than when the same elements are given mainly in the

form of animal flesh. That scrofulous patients usually become plump and ruddy upon the use of the oils, is a matter of common observation; and it is observable that this fullness is not permanent—the face soon becoming even more sallow than before, and the roundness giving way to a pithy obesity which is anything but indicative of good health. It is a well known physiological fact, also, that oils are more difficult of digestion and assimilation than the albumen, gluten and sugar of vegetables; and it would seem but a poor philosophy in attempting the rectification of a form of disease which is almost wholly due to failure in the nutritive apparatus, to feed the patient on that kind of aliment which is calculated to still further tax that very portion of the organism. The success, too, which has attended the use of a largely vegetable diet, both in single and extended observations, speaks much in favor of its adoption, notwithstanding the morbid cravings for flesh so common to some strumous persons. Yet it may not be advisable to wholly interdict the use of animal food; though I have seen enough of the efficacy of a vegetable diet to be decidedly prepossessed in favor of it, using butter, cream and meats more moderately.

In directing a patient to pursue this hygienic course, it must not be expected that marked benefit can be obtained in either a few days or a few weeks. Several months will usually be required to work the desired change; and, when the object is the preservation of the frame against the contingency of tubercular deposition, or perhaps an eradication of the tendency from the system, many years, indeed a whole life-time, may be required for the purpose. Great perseverance, therefore, is absolutely necessary in all cases where relief is worth obtaining or immunity worth enjoying.

The medicines to be used in scrofulous troubles must always be of the class that will arouse to action the different secreting organs, and also such as will improve digestion and the general vigor. Such articles are usually called alterants, or blood purifiers. The Compound Yellow Dock Syrup is a good article of this kind; while the Nervine Tonic or Spiced Bitters are good after meals to keep up digestion. It requires a long course of such treatment to establish a good condition; and it is always desirable to pursue a course of bathing, not having the baths too frequent, and using tepid or warm water with good friction.

CHAPTER VII.

BLOOD-POISONING, SEPTICÆMIA, PYÆMIA.

THESE terms are applied to cases where some form of destruction is going on in the tissues of the body, and the liquid products of that destruction are absorbed into the blood and carried around with the circulation. In cases of ulcers and some abscesses there is a liability to such blood-poisoning, but only when the general strength has been reduced. In diphtheria there is from the very outset such poisoning from the specific virus that causes the disease; but when the membrane in the throat begins to putrify, the exceedingly poisonous matter in it and under it is very liable to be absorbed, and then adds much to the danger. Erysipelas is another disease caused by some unknown poisoned condition; but when this forms pus among the muscles and other parts, this matter is likely to be absorbed and then to give the particular kind of blood-poisoning I am here speaking of. A number of diseases and accidents in life may thus add to the first danger the greater one of poisoning the blood by the pus formed in tissue decay.

This term, blood-poisoning, has become a very common one; there being a sort of mystery about it that enables certain physicians to cover up their own errors by ascribing almost everything to blood-poisoning. Not unfrequently it is used by such men in cases where no such poisoning can possibly occur, but where the vile and powerful poisons given by the doctor was the only poisoning.

The origin of real blood-poisoning cannot always be determined, but it is well to keep in mind its actual nature as above indicated. It rarely appears except in persons already quite prostrated by disease or injury, in whom the vital power to resist has been much weakened. Injuries to and operations upon feeble persons are liable to be followed by erysipelas in the parts, which in itself signifies the softening of the minute tissues and the formation among them of a thin pus that is very poisonous. Under such circumstances, this pus is very liable to absorption; and the people have long known the dangers of such erysipelas. Carbuncles are a source of this danger, the half-putrefying mass of even a small carbuncle sometimes causing serious poisoning. To wound by poisoned arrows was one of the practices of old Indian

warfare, the warrior usually dying from even a slight scratch. We see a corresponding danger in our own days from an imperfectly cleansed knife that has been used in opening a carbuncle, and has soon afterward been used in opening a boil or a simple abscess. I once attended upon a sweet child who had poisoned herself by a scratch upon the hand with a piece of bone that had lain in the yard with shreds of decaying meat on it; and the blood-poisoning had its own way for four days without treatment, and caused her death. This is also one of the dangers of recent mothers; and physicians are at times too careless, and carry from one patient to another the putrefactive discharges that cling in the minute furrows in the thick skin of the hand.

When such poisons are absorbed, they usually mark the danger by chilliness coming on suddenly without any apparent cause, and returning at short intervals, with a strange feeling of prostration between these returns of chilliness. The chills may be slight and transient, but are more likely to be severe and prolonged; and their returns are irregular and uncertain. Very profuse and cool sweats commonly follow the chills, the skin often being dry and harsh while the chill lasts. The pulse increases much in frequency, at first perhaps being of good size but showing prostration by its softness; but after a time the size gets very much less than natural, the beats mount up to 120, 130, 140, or more, to the minute; and it may fluctuate and waver in its action, which would be exceedingly alarming. The patient grows restless, breathing becomes greatly hurried, frequent nausea and probably vomiting are to be expected, the face is pallid and the expression anxious. As the conditions advance toward death, the face gets sallow, dusky spots and blotches appear under the skin, the tongue is glazed or dusky, and sometimes there is a fetid diarrhoea. In most cases there is an intense thirst most of the time.

In addition to these general signs, there may be local ones according to the place from which the poison was absorbed. Among the most frequent of these are sudden congestion of the liver, with swelling and abscess; congestion and suppuration of the lungs; weakness overwhelming the heart; oppression of the brain, with delirium or stupor, etc. All cases of blood poisoning are not fatal, the character of the pus that is absorbed being sometimes mild and the resistive strength of the person very great. But it is always a serious affair; and sometimes advances insidiously for several days, and then bursts upon the victim with fatal

suddenness. Those who fully recover from such an accident, are likely to be feeble for a long time.

Treatment.—If the mere frequency of the pulse were taken as the guide in management, one would resort to sweating and relaxing methods to relieve what seems to be a fever. But this would be the very opposite of good treatment; for the system is sinking under the relaxation of poison, and the great frequency of the heart is its struggle to sustain itself against danger. The whole system needs sustaining in the most vigorous manner, and the heart must be held up by proper tonics without the least regard to its great number of beats per minute.

Probably nothing so fully sustains the whole system in these conditions as a tea of the composition. It should be moderately strong, and given as freely as the stomach will receive it. Two to four tablespoonfuls every half hour or hour, as required, will be none too much; and some persons can drink half a cup or more every hour till relieved. Little amounts are but trifling with danger.

At the same time give a tablespoonful of the solution of soda hyposulphite once an hour; and a half tablespoonful of the tincture of myrrh may be added to each large teacupful of the composition tea. Myrrh and this particular preparation of the soda are powerful antiseptics; and must be used pretty largely while direct danger lasts, and then gradually reduced. Every three hours, give a tablespoonful of strong infusion of Peruvian bark and golden seal, in equal quantities. If the patient is very restless, put with this half as much blue cohosh as there is golden seal, and then give a tablespoonful every two hours.

Wounds, carbuncles, ulcers, or any other open place on the surface, must be washed freely every three or four hours with *warm* water containing half an ounce of borax to the quart, and a teaspoonful of solution of thymol. If the thymol is not at hand, put into each quart of water a tablespoonful of myrrh tincture in addition to the borax. Then put on the part a poultice of equal parts ground flaxseed and powdered charcoal, or boiled and grated carrots and charcoal; adding to either of these poultices one-tenth part of golden seal powder and somewhat less of powdered myrrh. Or tincture of myrrh may be used in wetting the poultice. Apply such poultices as hot as can well be endured, and put on an entirely new one every three or four hours, washing each time as above.

If the bowels are not open, give an enema of boneset, or weak

composition in starch water; but avoid physics. Rub the surface with a coarse dry towel when the perspiration is too free. Allow plenty of air in the room. See to keeping the feet warm and dry; and do everything with vigor and thoroughness, yet quietly. Recovery is to be nursed with great care by some good tonics and a generous diet.

CHAPTER VIII.

DROPSY.

By dropsy is meant a thin and usually transparent fluid in some of the cavities of the body, or in the loose tissue that forms a species of cell-like web in nearly all structures. Such fluid accumulates either slowly or rapidly,—occurring within a few hours in certain cases of scarlet fever, or only after many months or years in some dropsies of the abdomen, or of the limbs. It is a sequel to many diseases, becoming a part of their later history,—as inflammation of the brain in certain scrofulous children, after pleurisy, about the heart in some rheumatisms, other troubles of this organ, in the tissues of the lower limbs and in the abdomen from liver troubles, in the limbs and entire body from some kidney diseases or heart diseases, etc. So commonly is this the fact, that the real cause of the fluid accumulation must be looked for elsewhere; in very many cases it is found in some disease other than in the part actually swollen.

Dropsy is always a sign of weakness and general loss of tone, as also of a very poor and feeble circulation of the blood through the veins. It is, therefore, always a trouble of considerable danger. This may be seen in prolonged cases of ague, where dropsical swellings take place after the liver and the system in general have been reduced greatly in strength. Where it occurs from obstructions of circulation at the heart—whether from direct disease of the heart, or the great exhaustion of this organ and its vessels in the latter weeks of consumption, etc.,—it cannot be removed because it is a consequence of conditions that cannot be cured. For the same reason, dropsy from diseases of the kidneys which destroy or change the structure of these organs, cannot be removed. But other dropsies can be treated with much more hope of success,

and especially those general cellular dropsies that extend slowly from the feet upward; and when such accumulations are caused by impoverished blood,—as in scurvy, malarial diseases, anaemia, loss of blood, too long nursing, and other removable conditions,—due invigoration of the system will remove them.

Course and Symptoms.—The dropsies I aim especially to speak of in this place, come on gradually. Occurring in the abdomen, dropsy causes enlargement and tightness; and so pushes up the stomach and liver against the lungs as to bring on shortness of breath and palpitation. In the face it causes a puffy appearance, beginning under the eyes where the cellular tissue is most abundant. In the lower extremities it causes the feet to swell during the day as far as to the toes, where the cellular tissue ceases; and this swelling at first disappears during the night, when the person lies down and the fluid slowly moves up the limbs. As it increases, it extends up the limbs gradually, even quite to the thighs; and dropsy in the abdomen is common at the same time. The extremities are pale and cold; pressure causes a dent in the flesh, which fills up slowly; and the swelling may become so great as to give a burdensome sense of weight to the limbs, a somewhat shiny look to the surface, and in rare cases to burst the skin.

Dropsical patients are generally much constipated; have quite scanty urine of a high color, sometimes brown or bloody, but in some cases pale; and their skin is dry and cold. Thirst is quite common, the general strength fails, but there is no suffering except where the accumulated fluid presses on or displaces various organs. Dropsy in the chest after pleurisy will obliterate the air cells in a considerable portion of the lungs. Habitual drinkers are liable to such a general degeneration of the body as at last to fall into a dropsy from which they are not likely to recover.

Treatment.—The particular disease that has led to a dropsy must always be attended to first,—as of the liver, kidneys, heart, pleuræ, anaemia, tumors pressing on veins, etc. This done, it is next of great importance to sustain the general tone of the frame by good tonics, among the best of which are golden seal, gentian, and scullcap. Such tonics may be combined, or the Spiced Bitters may be used, giving them in suitable doses three or four times a day. It is also necessary to keep up a good stimulating action upon the circulation and the skin; and for this purpose probably nothing is better than a hot tea of composition drank quite bountifully every two or three hours. Because of a blunted state of the

nerves in all dropsies, stronger doses than common are required and a fair share of cayenne may generally be added to most any kind of medicine used. I am very partial to directing these patients to simmer three or four good-sized onions in a quart of milk for an hour or more, and then have them drink the milk freely. It is of great value in helping to keep the kidneys in action, and also aids in removing the fluid by having the glands absorb it. A pretty hot vapor bath once or twice a week is also of great value.

It is important to keep the bowels open, and two movements a day are usually desirable. Physics that act upon the liver are generally best, and should always be of a tonic character. A strong syrup of equal parts of butternut and wahoo, with one-fourth part of blue vervain, is a suitable physic, and may be given night and morning. When the system tires of this, a little bitter root may be added to the Spiced Bitters; or a pill may be made of powdered bitter root and a very small portion of cayenne pepper mixed into a softened extract of butternut. Invaluable as it is to maintain good action of the bowels, it is always necessary to do it with such slow and moderate articles, even though considerable doses will be required; for severe physics are irritating, and in the long run weaken the patient and do him harm even though for a short time they reduce the swelling.

It is a common belief that dropsies are to be cured by acting on the kidneys with great force, but this is a decided mistake. A great amount of mischief has been done by using large quantities of powerful diuretics. It is exceedingly important in all cases to get a good and steady action on the kidneys; but, as with the liver and bowels, it should be done by toning agents and never be excessive. It is always easier to get the kidneys to act properly after getting the skin and the liver doing well, as by the above measures. Then for the kidneys themselves, some juniper berries may be used in the tonic that is given four times a day; or some dwarf elder bark is excellent. I may here add that the leaves of the common mullein made into a strong decoction, and then the composition added to this, and drank warm with freedom, make an admirable remedy to remove the accumulations of fluid.

Sometimes the fluid in the abdomen is drawn off by tapping; but this is far from being a cure, though it may be resorted to as a last means of averting suffocation from pressure on the lungs. It should be avoided whenever possible; for it suddenly removes pressure and leaves the fluid to accumulate again pretty rapidly.

CHAPTER IX.

ABOUT FEVER IN GENERAL.

FEVER always includes the two prominent features of a circulation hurried beyond its natural rate, and increased heat upon the surface and through the body. These arise under such a large number and variety of circumstances, that some degree of fever is present in a decided majority of the acute maladies to which man is liable. With these two constant symptoms are associated a wide diversity of others, varying according to the circumstances and combinations of each case,—these diversities leading men to class fevers in several groups, according to some prominent fact in each history, as Stomach Fever, when the provoking cause of the disturbance is chiefly in the stomach; Brain Fever, when the brain is particularly affected; Lung Fever, Scarlet Fever, Malarial Fever, etc. In nearly all cases where any organ suffers acute inflammation, the nerves will convey the excitement to the heart and more or less general fever will result. In this way we find fever arise with inflammation of the tonsils, bronchi, pleuræ, stomach, liver, etc. In this chapter, however, I will more particularly have in view the general fevers where the prime cause is not a local inflammation.

Amid such diversities, there are some common facts that should be apprehended clearly. Thus, every fever history may readily be divided into four stages, according to symptoms more or less distinctly present. These stages are as follows:

1st Stage. Premonitory.—Before the fever begins, there is a period of vague uneasiness and depression, of disturbed and unrefreshing sleep, and of general discomfort. Commonly there is some loss of appetite and disrelish of food, feeling of lassitude or tiredness, and probably an inclination to yawn and stretch. Such feelings may presently be followed by more decided ones, as aching of the muscles, headache, pains in the back and limbs, and probably some chilliness, with a peculiar and unaccountable loss of strength.

These are spoken of as *premonitory* symptoms—warnings of approaching trouble. Sometimes they are slight and continue for but a few hours, but more frequently they are distinct and gradually increase in vigor for several days; and then there will be time to add to them dry or clammy tongue with fur upon it, costiveness, scanty and high-colored urine, dry and cold skin, and other signs of deficient secretions and feelings of depression. Indeed,

such scantiness of the secretions and feelings of depression precede all fever cases in greater or less degree; and while they may be present for a time without being followed by any particular fever whatever, they are always notes of warning; and many a severe spell of illness might be moderated greatly, or averted altogether, by heeding the warnings and promptly yet gently improving the secretions and using mild diffusives to the circulation.

2nd Stage. Cold.—In this there is a feeling of chilliness, beginning usually in the back and extending thence over the limbs and body. Chilliness may be light and transient, the person faintly recognizing it as an increased sensitiveness to slight currents of air in the room, which other persons in the room may not even realize; or from this it may increase to feelings of distinct coldness, or to successions of real shiverings.

This coldness may come on abruptly, but most frequently the premonitory symptoms gradually merge into the cold stage,—which may continue but a few minutes, or the shiverings may recur at intervals over one or several hours, or in some rare cases may continue from time to time during several days. The longer the cold stage endures, the greater the general depression and the more serious the subsequent history, as a rule; and this even when the shiverings may not be at all severe. Hence it is always of great importance to cut short any chilly or shivering conditions whatever, and not to tamper or trifle with them because they seem light.

During the cold stage, it is quite common to find sharp pains arising in the back, loins and head, even if they did not exist before the sense of coldness came on. Such sufferings, together with the feelings of depression, are likely to cause considerable nervousness and restlessness. The pulse becomes somewhat depressed and rather slower than natural, sometimes gets small and weak, the nails usually look leaden, the hands pale or mottled and cold, the face dusky or pale, perhaps the features somewhat shrunken, and the mind languid or even drowsy and dull. The feelings of chilliness are due to a sudden and peculiar depression of the nervous system, which, in turn, soon depresses the heart and the general circulation. Very rare are the fever cases that are not more or less distinctly ushered in by this cold stage.

3rd. Hot Stage.—This is the fever proper, with its hastened pulse and increased bodily heat. It is a re-action of the life power against the cold stage; for a long continuance of the cold stage would cause death, but the on-coming of the hot stage is nature's

struggle to ward off death. The heat extends over the whole body, the surface is very dry as well as hot, the face is more or less flushed, and the internal heat rises to 100° , 102° , 104° , or possibly to 106° or 108° F., the natural internal heat being a fraction above 98° F. At the same time the pulse gets hurried in pretty exact ratio to the increase of the internal heat,—each advance of eight beats a minute of the pulse usually giving an increase of one degree in the thermometer. Respiration is also hurried, the natural rate being about 17 to the minute, a little more in nervous temperaments, or one full act of respiration to every four and a half beats of the heart; and as the heart-beats increase their frequency in fever, the respiration increases in pretty nearly this same ratio. These ratios are not absolute for all temperaments and conditions, but yet hold pretty closely to these figures. As a common fact, the rates between pulsations, breathings and internal heat observe the following table somewhat nearly:

80 Pulsations,	18 Respirations,	99° Fahrenheit.
88 "	19+	100°
96 "	21+	101°
104 "	23	102°
112 "	25—	103°
120 "	27	104°
128 "	28+	105°
136 "	30	106°

Mere frequency of pulse, however, is not the chief significance of heart action in fever, its size and firmness often varying, to which I will make further reference at another place in this chapter.

During fever, the head usually aches; the senses are disturbed, being either blunted or very acute; sleep is not natural; the mind is liable to some degree and form of disturbance, especially at night; the tongue is much furred and inclined to various degrees of dryness; the secretions are very deficient, and are much changed in character.

The duration of a fever case may range from a few days to several weeks. Each twenty-four hours it is probable that there will be a perceptible fluctuation in the excitement,—it commonly rising toward evening and through the first half of the night, and then abating in a degree after midnight and towards daylight. In some fevers, this abatement is but moderate, though observable; in other cases it is quite distinct, almost to the point of disappearance;

and in malarial fevers the period of abatement is decided, though it may be at other than the early morning hours.

4th Stage. Defervescence.—By this stage is meant the full actual decline of the fever. It is marked by an increased freedom of one or all the secretions,—the flow of a warm perspiration in fair quantity usually being the first, soon followed by discharges from the kidneys and bowels. Saliva becomes more abundant and thinner, moistening the tongue and mouth; the pulse abates its frequency, and becomes soft and full; and at the same time the external and internal heat lowers, the respirations diminish in the above ratio to the slowing pulse, and the sleep becomes undisturbed and refreshing.

Sometimes defervescence takes place suddenly, with rather copious evacuations and rapid lowering of temperature, when it is called a *crisis*. Evacuations that are in moderate excess of natural, carrying off accumulated offensive material with some freedom, are most satisfactory. When they suddenly become excessive and prolonged, they are exhaustive and unfavorable,—as a drenching perspiration that after a time gets cold and sticky, several very large and thin discharges from the bowels in close succession, etc. But it is more common for the lowering of the fever to occur gradually, over a period of several days. When the unnatural excitement is gone, the patient is lax and helpless—is said to “feel his weakness;” and the power of appropriating nourishment during the fever was so exceedingly small, that now he is weak and very much emaciated. Convalescence involves the slow return of the nourishing powers, and its accompanying restoration of the general strength.

Considerable variations in the history of these several stages occur in different cases, and give a particular form or kind of fever, as will be described in following chapters. In every case, it is the fact that the secretions are, for a considerable time before the outset of the fever, diminished in amount; and much more diminished while the fever continues. It is also the fact that the tissues of the body waste, especially the muscles and fatty tissues; and this waste is retained in the system, to its great detriment. Relief and hope come, when the secretions are resumed and the poisoning accumulations of waste material are carried out. Be all the other diversities what they may, these two general facts are constant.

The heart action and circulation are acts of the Vital Force (p. 12). So human heat is a vital manifestation. Fever itself,

therefore, is an effort of vitality; and it continues while the above-named disturbances of the secretions continue, and when these are again established and the accumulated waste is carried off, the fever subsides. When the pulse is of full size and firm, and the flush upon the surface is bright rather than dusky, there is evidence that the Vital Force is vigorous in its action. A fever of this kind is said to be a *high* fever, the pulse frequency ranging from 95 to 115 in adults; and so long as it continues of this grade, it is more promising than otherwise.

But if a fever is protracted through many days or weeks, the accumulations in the system become more and more poisonous; the heart and nervous system weary and weaken under the foul load and the prolonged struggle; and then the pulse becomes smaller and more irritable, its frequency runs up to 120 and more per minute, and these facts mark deficiency and loss in vital power, and the case is one of *low* fever. In proportion as the pulse gets above 120 and diminishes in size, the danger increases.

Some fevers are inclined to the *high* grade. Among these are the fever of small-pox, malaria, rheumatism, lung fever and a number of others. In these, the disturbances are all strong and severe, the shiverings at the outset are severe, the fever comes on promptly and vigorously, the pains and headache are sharp, the pulse is large and strong, the skin is exceedingly hot, restlessness is great, and delirium is common and active. Such fevers may become low by long continuance; but do so only after a considerable time and under bad circumstances.

Many fevers have an entire history that is *low*. Among these are typhus, typhoid and others that have their origin in some specific poison, (p. 72), and those that follow in the course of blood-poisoning from injuries. In these the course is slow and insidious, the chills are moderate, the muscular depression is early and decided, febrile outset is gradual in development, the pulse is small and rising to 120 and upward, the heart itself is weak and easily overcome, tongue exceedingly dry and inclined to become brown, the nervous system greatly disturbed with a tendency to low and muttering delirium. All these cases are dangerous.

Some fever cases can be cut short in a somewhat brief time; others cannot be cut short to any great extent, but may be moderated decidedly and conducted to a safe conclusion, though occupying a quite definite period of time. Among these are fevers arising from specific poisons, such as small-pox, measles,

typhoid, typhus, etc. Such fevers are said to "run their course,"—by which is meant that the poison in each is quite sure to continue a certain period in the system, and the frame cannot be rid of it in less than this time, though the disturbances it causes may be made light and greatly reduced in their danger.

Nowhere, in all the history of disease, is it more important to take into account *all* the symptoms that are present. It is a very common failing to confine one's attention to one or two symptoms and neglect giving proper consideration to others that are quite as important. In pursuing this course, very narrow and insufficient views of a disease are obtained; and then persons manage it clumsily, and get alarmed when there is no real ground for alarm, or neglect to observe changes of importance and thereby waste favorable opportunities.

Nowhere are these mistakes made oftener than in fevers. It is not at all sufficient to count the number of beats of the pulse to the minute, or to take the internal heat by a thermometer placed in the mouth or under the armpit. Both these give useful information, so far as they go; but they do not go far enough, do not furnish any information on the great question of the secretions, nor on the equally great matter of the state of the nervous system, and are of no value whatever in pointing out what remedies are needed. If the grade of arterial excitement, and the amount of inward heat as told by the thermometer, constituted the chief ingredients of a fever; then we could stimulate the *low* grades with some alcoholic, and reduce the *high* grades with veratrum and iced-water, and have done with it. Such methods have been tried, and the mortality under them has been enormous,—far greater than when no treatment whatever is attempted. (See the chapter on Alcohol.) I prefer a broader and more scientific view of the facts, and warn my readers against such narrow and dangerous follies. Let us use some common sense in these matters.

General Principles in Treatment.—In treating any fever, it is desirable to have the frequency of the pulse brought as early as possible to the natural rate, and the excessive heat of the body reduced. But as these are vital expressions of disturbance,—consequences of disease rather than the disease itself,—they are most naturally and effectively corrected by restoring the deficient secretions, removing the offensive accumulations, and soothing while sustaining the nervous system. For instance, fever often arises when a healthy stomach is overloaded with rich food that is

undigested. Such food may remain in the stomach two, three and even four days, almost wholly unchanged. During this time the person may have had chilliness, loss of appetite, headache; and then decided fever, restlessness, thirst, and possibly some delirium. If, now, we turn attention to lowering the pulse by veratrum or aconite, and to lowering the temperature by very cold affusions, and to quieting the restlessness by morphine or some other narcotic, three direct violences have been done to the sufferer and he has received no actual benefit whatever. The undigested food remaining in the stomach continues to provoke disturbance; and the three measures used not only fail to relieve the system of the one chief cause of trouble, but are hindrances to the system relieving itself. Cast out the half putrefying materials by an emetic, (physic will not do it), and the fever subsides quickly. Allow it to remain, and the whole body gets tainted and reduced, and a distinct spell of sickness perhaps follows.

By this simple example I may typify the needs of every febrile case. Free the system from any and every source of fever provocation, put each organ "to rights" in the most direct and natural manner, soothe naturally where soothing is required, sustain where sustaining is needed, and then the rapid pulse and the high temperature will be relieved without the system suffering any damage from them. When such patients are managed on this principle, there will be none of those shattered constitutions which are so commonly charged up to "the fever," but which are due rather to the aconite, narcotics, calomel, veratrum and other general mismanagement.

From the fact that most or all of the secretions are diminished or nearly suppressed before any febrile excitement is developed, and this excitement begins to subside favorably so soon as the secretions begin to reappear, it is plain that the secretions should receive constant attention in every case of fever. It is impossible to place too much stress on this, or to attach too much importance to it. It should be made the central feature in all fever treatment. Whether the poisonous impressions of the retained secretions themselves be considered alone, or whether the damage of typhoid or other specific poison be added to the account, it is by persistently and in a natural manner acting upon the secreting organs, that these sources of fever provocation are to be removed. In no way can the poison of measles, scarlet fever, small-pox, malaria, typhus, typhoid or any other infection be cast

out of the system, except through and by some or all of the secreting organs.

In using medication for these, articles should be chosen suited to each case and no organ should be driven to excessive action, (p. 232). Over-exertion forced upon any organ, is wearisome to it; and no wearying compulsion is favorable to any fever patient. While effective action is necessary to the secerments, and is to be maintained steadily; it is but playing the fool to drive the bowels to inordinate discharges, or the skin to dripping perspiration, or the kidneys to exhaustive urination. And if any secretion is already too great,—as the bowels in typhoid, the skin in rheumatism,—that secretion is certainly not to be excited farther, but rather is to be checked, in that case, however much the others need promoting.

But while this is so very important, it does not constitute the total treatment of a fever case. It is necessary to soothe and sustain the nervous tissues, which first suffer a species of shock, as shown by the chillness and aching, and then suffer from irritation, as shown by the restlessness and disturbed sleep. But no narcotic of any class is the proper article to give, however tempting may be the prospect of securing sleep by its use; for the sleep thus obtained is wholly unnatural and leaves the nervous system in a worse condition than before, while narcotics increase the sluggishness of the secreting organs and promote blood-crowding upon the brain. People may use narcotics—as opium, morphine, chloral—and get well in spite of them; but I am trying to tell the people how to restore health naturally, not how to trifle with life and increase the risks of death. Pay careful and constant attention to relieving the nervous system in fever,—much of which is done by a due restoration of the secretions and removal of their damaging impressions, and the remainder is accomplished by the sanative nervines elsewhere directed.

I have already alluded to the unnaturalness of lowering the pulse by veratrum, aconite, etc. Such articles, and others like them, act by partially paralyzing the heart. When the secrets of the resurrection day are revealed, I have no doubt but millions will appear who have been hurried into eternity before the Lord called them, through dosage with such heart paralyzers.

In *high* grades of fever, the total medication is to be mainly of a relaxing character. Agents for the skin, liver, bowels, kidneys and nerves need to be mostly of this class. In *low* fevers, on the contrary, there is need of a more toning class of agents; and some

form of sustaining agent must be used for skin, liver, bowels, kidneys and nerves. In this form, let the particular fever be what it may, the heart and all the bloodvessels must be properly sustained; but never by any form of alcoholic stimulation, which is unnatural and injurious. These are the general principles of treatment; the particular and appropriate articles will be given hereafter for each form of fever.

The nursing of a fever patient is an exceedingly important factor toward its recovery, and will be directed in considerable detail in the part on Nursing. What goes into a fever patient's stomach in the shape of food, is fully as important as the medicine given; for food that is not and cannot be digested, will pass into one or another stage of chemical change and become an actual poison to the frame. Seeing the loss of flesh and strength in all such cases, and knowing that these can be replaced only by food, some people are disposed to force the heartiest dietary upon all these patients. Immense mischief may thus be done—even many days or weeks after the fever has subsided, the stomach remaining too feeble to digest any but the lightest foods.

Relapses in fever, catching the frame weakened and with lessened rallying power, are always dangerous. They generally are due to some palpable error in diet, or other failure in good nursing. Hence it is always best to "make haste slowly" in this stage, and to guide convalescence with great care and suitable supportive medicines for a considerable time.

CHAPTER X.

SIMPLE STOMACH FEVER.

CHILDREN frequently, and adults occasionally, have a moderate grade of fever arise from too much eating, the food lying in the stomach undigested. The pulse increases fifteen to twenty beats a minute, is of good size and rather soft; the bodily heat rises in proportion, the skin not being very hot or dry, but easily inclined to a little perspiration for a few minutes at a time; the tongue is furred, light-colored, and moist; there may be considerable thirst in a child, or drink and food may both be rejected; there is some restlessness alternated with brief spaces of drowsiness; and some-

what nauseated feelings at the stomach occur at intervals, probably causing a child to look suddenly pale in the midst of the slight flush of this grade of fever. In some cases, as mentioned in the last chapter, the food remains in the stomach a considerable time, with stronger fever, headache, general excitement, and possibly some delirium at night. This last symptom is very likely to alarm a mother who is not always calm enough to note the total mildness of the symptoms, and forgets that children easily become disturbed in mind at night.

Such cases are soon broken up. A dose of Neutralizing Cordial every two hours is usually sufficient. If the patient vomit, so much the better; and he should be induced to vomit by warm salty water if relief is not soon obtained and there is reason to suspicion the presence of soured food in the stomach. Follow this with some of the cordial every four hours, give a tea or syrup of the cherry bark to soothe and tone the stomach, and greatly limit the diet for a few days.

CHAPTER XI.

MEASLES. MORBILLI.

An infectious disease rarely escaped in childhood, coming in epidemics, occasionally seen in adults and quite elderly people, sometimes occurring more than once. The symptoms begin from eight to twelve days after exposure. Rarely dangerous; much more severe in adults than the young; by exposure strongly prone to bring on pneumonia, bronchitis, diarrhea, etc., and then to become fatal in an extreme degree.

Symptoms.—After one or two days of lassitude and poor appetite, there are cough, frequent sneezing, watering at the nose, red and somewhat swollen eyes that look watery, a little puffiness of the face, and other signs of a cold; and considerable fever starts up suddenly, probably with aches. Next day the fever is less, but the other symptoms increase for two more days, probably with slight throat soreness, swelling of the glands under the jaws, swollen eyelids, sensitiveness to light, much thirst, a moist tongue with many bright red spots showing through a thick whitish fur, probably bleeding at the nose. On the fourth day, a rash appears

on the forehead and cheeks, traveling downward to the feet by the sixth day; and with its appearance the fever again rises for a day or two, there is general sharpness of the above symptoms with prostration, itchiness of the surface, and some odor. The rash begins to decline in three more days, with a gradual subsidence of all the symptoms.

Measles rash is moderately red, in nearly circular dots, slightly raised so as to roughen the surface, dots grouping in blotches of a dull red-raspberry color and rather crescentic outline, fresh spots after ten or twelve hours, mostly on the face and neck, many on the chest and back, few on the extremities. Swelling of the face subsides twenty-four hours after the rash appears, the spots are no longer raised; the rash disappears in the order of invasion from head to feet, becomes pale, leaves a yellowish discoloration, and is practically gone by the fifth day, though a mottled discoloration may remain to the second week or longer. On the third day of the rash, the surface over the dots begins to roughen, and continues for a few days to come off in minute, thin scales. The tongue clears off, and appetite and strength return as the rash fades.

Such is the usual history, but there are many variations. Some children seem scarcely to be ill till the rash appears, when they suddenly become feverish. Some have cough several days before the rash; and this cough remains a prominent symptom, with much rattling, and a strong inclination to lung troubles for weeks after. Breathing is at times much hurried, and then pneumonia or bronchitis is to be feared. Delirium, especially at night, may occur at the inception or with the rash; or there may be stupor, or even convulsions. Inflammation of the eyelids, with pus and danger to the sight, is liable with the scrofulous. Diarrhea is not at all uncommon, and at times is severe and dangerous. Some pass through it so easily as to seem little disturbed, most are weak; some are greatly prostrated in the nervous system, and are liable to nervous and stomach troubles for many years after. Sudden and premature recession of the rash, from cold or exposure, gravely endangers the lungs, and rapidly cuts off the most robust when measles appear in camp. Though in the main a very simple malady, it is exceedingly fatal when trifled with or interrupted. In some the rash does not appear freely; and then the poison may remain in the system, causing for years attacks of strange sinkings at the stomach, nervous sinkings, etc. I once treated a man aged

73, who traced such attacks to the time he had measles in boyhood, and in three weeks obtained a bountiful crop of measles and complete relief from any further attacks. Many similar cases have come under my care.

Treatment.—Keep the patient in a warm room, well darkened and ventilated, and use any mildly sweating drink, as white root, ginger, pennyroyal, etc. Flaxseed with ginger is very proper for cough and fever, a tablespoonful or two every hour or so. Allow no cold drinks; bathe the feet in warm water, and use only warm water for cleanliness; give light and nourishing food regularly; move the bowels with syrup of rhubarb or powdered magnesia, but carefully avoid purging; give a child a warm bath if the eruption is delayed, or if head symptoms or convulsions occur about the time the eruption should appear. When the fever abates, use the compound spikenard syrup every two or three hours for the cough; or equal parts of it and cherry syrup if the lungs are sore or the bowels loose. If the patient seems prostrated, use the composition powder as a tea freely, and give a little golden seal or scullcap every three hours. If the eruption turn very dark, give the composition tea rapidly; and an enema of the powder in starch water every two hours, and retain. Wash sore eyes with a weak tea of golden seal or raspberry leaves. For diarrhea, use syrup of cherry and neutralizing cordial, and bathe the abdomen with nerve liniment, and give the spiced tea.

Protracted cough or diarrhoea, discharges from the ears, sore and inflamed eyes, and similar troubles following measles, are sometimes very obstinate. Manage them as under other circumstances. Feeble children may have the seeds of consumption started by ill-managed measles, hence require very great watchfulness. Sometimes an interruption of the rash leaves the poison in the system, causing for years peculiar feebleness, weakness and strange faint feelings at the stomach, and many other unpleasant symptoms, as already mentioned. By a purifying and invigorating course, I have several times brought out an abundant eruption six, ten, and in one case sixty-three years after the first attack of the malady,—to the complete relief of the patient.

CHAPTER XII.

GERMAN MEASLES. ROSEOLA. RUBELLA.
ROTHELN.

THESE terms are applied to a malady resembling measles, and also presenting some features of scarlet fever. A rash appears suddenly, without sneezing or other catarrhal signs, often with no fever or but little; but with some fulness of the head and giddiness, backache, and slight throat tenderness for a day. The rash appears first and chiefly around the body, sparsely on face and extremities; bright, raised, rounded, with slight heat and fever. The cheeks may be flushed, the eyes a little red and lids swollen, throat red and slightly tender. The rash disappears in three days, with itchiness but no material discoloration, sometimes the surface chaffing off as fine bran. After this there may be slight catarrh, stuffy nostrils, cough, and sore eyes; and exposure may then give serious lung troubles.

Treatment is chiefly by careful housing, opening the bowels by magnesia or a seidlitz powder, and a light diet. In from three to five days all is past, unless bronchitis or dropsy follows. It is very slightly contagious, and does not seem to give immunity from true measles.

CHAPTER XIII.

SCARLET FEVER. SCARLATINA.

A DISEASE of childhood, sometimes attacking adults; of very different degrees of severity in separate epidemics; exceedingly contagious, and capable of being carried long distances and for a long time; yet many escape it through every form of exposure. It may pass the feeble and attack the robust; some are prone to its recurrence; some escape it, and then contract it when in the best of health. Epidemics tend to recur every five or six years, and often in the fall. Unwholesome dwellings serve to intensify it; the heat of summer often extends but modifies it. Infection from it may begin the first hours of fever and before rash appears, and continue for six or even nine and ten weeks after. "Clothes removed to a distance and unpacked months afterwards will give

off infection. Every case of sore throat occurring in an infected house is capable of conveying scarlet fever and starting the disease elsewhere. Sore throat in children is always sufficient reason for keeping them at home. It need not spread; timely isolation of the first case is mostly successful; but if others in the family have received the infection, the sickness will appear in less than a week, when a second separation is sure to be effective." (*Wm. Squire, M. D.*) Infection begins to show about the fifth day, never later than the seventh, often on the fourth, at times in a few hours.

Symptoms.—Sore throat, with more or less tenderness on swallowing, usually precedes the other symptoms by a day or two, perhaps from a few hours after receiving infection. There will be pallor, drowsiness by day, restlessness at night, aching of limbs and forehead, probably vomiting, occasionally convulsions or stupor. Fever sets in suddenly, with rapid pulse, very high and burning heat, suffusion of the eyes and flushed face, thirst, glands at the angles of the jaws enlarged and tender, some stiffness of the neck, tongue furred except a strawberry red at the tip and edges, palate and tonsils red and swollen. A very fine rash may appear on the neck and chest at once; but it oftenest comes on the second day of fever, as numerous fine red points close together; first on the neck, face and chest, spreading less profusely, very soon giving a bright scarlet appearance to large patches of the surface, and deepening at folds of the joints and the parts on which the body rests; brighter in the evening than morning. Steady pressure leaves a yellowish tint for a few moments; a white streak is left on the abdomen or thighs by drawing the finger-nail firmly across a red patch. Rash is at its height by the fourth day, with swelling and tension of the skin, and puffiness of eyelids, hands and feet. It fades on the fifth and sixth days, when the fever lessens, but does not wholly abate till a week or so later. From the seventh to the ninth day the cuticle begins to peel off and continues to do so for a week or two; sometimes the new skin peels off, even a second or third time; the desquamating particles are large and branny, very light, and capable of conveying infection to the last and to long distances. So long as this goes on, the kidneys are liable to inflammation, and serious or fatal dropsy may set in very suddenly two or three weeks after the rash has gone.

Such is the usual history of a *simple* case; the urine being muddy as the rash subsides, and the previous costiveness now

perhaps changing to diarrhoea. A few cases are much lighter, the child scarcely keeping his bed; but the strawberry tongue, red and tender throat, scarlet cheeks, suffused eyes, and final peeling of the cuticle, mark them all.

In the form called *anginose*, all the above symptoms are strongly noticed, with the addition of much more severe throat symptoms. The palate and tonsils are so much swollen as to make swallowing difficult, at times sending the fluids back through the nostrils. Thick mucus is secreted in the throat, turning to dark brown or brown-black, ending in ulcerations with troublesome quantities of tough phlegm and other acrid and offensive discharges. Black crusts and thin acrid pus appear in the nostrils, and are liable to run back through the Eustachian tube into the inner ear and burst the ear drum,—leaving deafness. Similar crusts appear on the tongue and lips, and the acrid pus may reach the stomach and cause distress and fatal ulcerations. The rash is in more scattered patches and less persistent, and abscesses of the neck and in the joints may follow. Some cases have mortification in the throat. Anginosa is always exceedingly dangerous.

Malignant scarlatina is rare. It presents great depression from the onset, uneven heat upon the surface, a small and scattered rash that soon turns to livid spots and disappears early, a wildness of delirium or deep stupor. There may be much or little throat affection; bleedings from the stomach and bowels by vomiting or diarrhoea; rapid sinking by the fourth day or earlier, some dying by the second day and some in a few hours.

Sequences.—Dropsy is quite sure to follow any chilling or exposure within three weeks after the rash disappears, and sometimes as late as five or six weeks. It is always serious and demands the most scrupulous care of the child for the time stated. Even simple cases, in apparently completed convalescence, may suddenly fall into dropsy. Temporary deafness is common; permanent and incurable deafness if the ears burst. The kidneys are affected with some inflammation and casting off of debris almost as constantly as the skin, undergo changes as the skin does, and may by carelessness be thrown into severe trouble. Heart irritation for a couple of weeks is common; rheumatism is not infrequent from the first to the third week, with increase of fever and perhaps bountiful sweating; abscesses in the joints may occur, and so may pleurisy at a late stage, or even pneumonia. Simple or severe forms of scarlatina are thus liable to cause much damage to the

subsequent health, especially if in any way neglected; yet the great majority never suffer these after troubles.

The sudden high fever without previous cough or sneezing, tender throat and strawberry tongue, with bright rash in broad blotches, mark scarlatina. Very high fever at the start, increase of fever after fifth day, severe throat symptoms, scanty and dusky rash, are bad tokens. No child is out of danger from kidney trouble till after the third week, even in mild cases; and the delicate and feeble may be in danger from six weeks to three months, unless guarded scrupulously from colds.

Treatment.—Strict isolation, even of those who merely complain of tender throat during an epidemic, is demanded. Mild and simple cases need little medicine, but strict housing and hygiene. Keep the bowels well opened by Rochelle salts, or syrup rhubarb with cream of tartar added. Allow lemonade several times a day, and a teaspoonful or more of iced water frequently. A tepid sponge bath every day or twice a day, bathing part of the surface at a time, is grateful during the great heat, and may be followed with light application of cream, goose oil or cold cream ointment over the whole body, till the skin begins to be loosened off. Borax water, of ten grains to the ounce, is a good gargle or spray for the throat every two hours; or borax may be added to an infusion of cherry bark or of witchhazle leaves. One or two tablespoonfuls of queen of meadow and ginger, in warm tea, may be given every two hours. Diet should be plain, and a light covering worn around the neck.

In severe cases, use a tea of camomile and ginger every hour or so. Gargle or spray the throat with an infusion of golden seal having in each ounce ten grains of borax and a teaspoonful of the tincture myrrh; or else two tablespoonsful of vinegar, a teaspoonful of salt, and a teaspoonful of myrrh tincture. Three or four grains of cayenne pepper may be added to each gill of either of these gargles, if the throat signs are bad. Put on the outside, over the tonsils and under the jaws, the nervine liniment every three hours; in very bad cases the stimulating liniment; and a light flaxseed poultice sprinkled with golden seal and ginger may be used under the ears and the angles of the jaws, if painful. Allow cold water and lemonade for the thirst, and very small bits of ice in the mouth occasionally, but be careful not to allow enough to chill the throat or stomach. Sponge the surface cautiously with fully tepid water, and use ointments as before. If there is

much restlessness, give an enema of lady slipper, a teaspoonful, scullcap one-fourth teaspoonful, in thin starch water every three hours, and retain. Move the bowels daily with rhubarb and senna syrup. If the symptoms get severe about the fourth or fifth day, nothing will afford such sudden relief and turn the aspect of affairs as a rather stimulating emetic, given so as to act quickly. I have sometimes been forced to use such an emetic every twelve hours for two days, and saved life. Cleanse the nostrils of dark crusts, apply inside an ointment of a teaspoonful of powdered borax in an ounce of good lard, and spray into them every two hours twenty grains of borax and a half ounce of glycerine in an ounce of water. Give broths, soups and sustaining diet well seasoned.

If throat ulcers are deep and acrid, or threaten to slough, a proper spray will be a teaspoonful of thymol solution, one of tincture myrrh compound, two of glycerine, and an ounce of pretty strong golden seal infusion, used liberally every hour. Poultices with golden seal in a little flaxseed, and moistened with a tablespoonful of compound tincture myrrh in the water, are potent in such cases. Patients much prostrated may have compound tincture Peruvian bark every three or four hours. Wildly restless and malignant cases may have the composition tea freely; and every two hours an even teaspoonful of scullcap and one-fourth teaspoon of powdered myrrh (or two teaspoons of myrrh tincture) by injection.

If dropsy appear, give freely of a warm drink of equal parts white root and composition every hour, with nervine liniment over the whole body every four hours. Seeds of water melon may be added to the drink to move the kidneys, or a strong tea of queen-of-meadow given every three hours. It needs vigorous treatment to open the skin and kidneys and save these dropsied patients. Other troubles must be treated according to their nature. Convalescence must be guarded, and suitably sustained by the Nervine Tonic.

Scarlet fever is oftentimes quite indistinct in its symptoms, and seems to be mixed or confounded with other eruptions, yet to run a very dangerous course. The strawberry tongue is uniformly distinct; but if there is any doubt, it is best to treat the case as scarlatina rather than as some lighter malady.

CHAPTER XIV.

DIPHTHERIA.

CHILDREN from two to ten years suffer most with this malady; but it frequently attacks those in the early years of manhood and womanhood, and on even to old age. Scrofulous, feeble, ill-fed and poorly housed children are easily seized by it; and so of those who have recently had scarlatina, measles, or whooping-cough. Some families are inclined to it, and have it severely. Close communities, as in schools and large families, promote it. It is sharply epidemic, and contagious to a considerable degree. Severe forms have been very fatal. Foul accumulations around houses and school-houses, and privy and sewer gases in cities, are among its direct promotive causes. The same malady has been known for centuries under other names. While the principal symptoms are local to the throat, it is virtually a constitutional disease, poisoning the blood and greatly depressing the frame.

It may develop in from twelve hours to five days after exposure. Sometimes as late as the eighth to the twelfth day. It has at times seemed to lie latent for several weeks, and then flash up suddenly and very severely on slight provocation. Very many persons are fully exposed to it without contracting it; and it would appear that direct inhalation of the patient's breath during the fetid stage, or getting some membrane or mucus from the patient's throat, is usually necessary for its conveyance to another.

Symptoms.—No distinct signs of invasion, some being attacked suddenly, others having a few days of languor, poor appetite, tickling cough, hoarseness, paleness, and perhaps diarrhoea and chilliness. In *simple* forms there are some mild fever, headache, furred tongue, some huskiness of voice, and difficulty of swallowing. Palate and tongue are red and swollen; and by the second or third day a whitish membranous deposit appears on these in variable spots and patches, adhering firmly to the surface. These conditions continue from five to nine days, the patches turn yellowish and gradually are loosened away, the patient is pale and feeble and gains strength rather slowly.

In more severe and decided forms the fever is high for some days, and then may drop suddenly; the membrane is thick, of an ashy color, the parts around swollen and dusky red, the voice much changed, the nose often stuffed up, the eyes a little suffused, the

breath offensive. In from three to five days the membrane has turned darker and begins to loosen and peel away, the fever then declining and the patient being quite prostrated. This membrane may extend into the larynx, give croupy cough and voice, difficult breathing, and other dangerous croupal symptoms; and when it loosens it may cause death by suffocation. It may extend upward into the nostrils, or downward into the stomach and bowels. It may attack the larynx or nostrils one or several days later than the tonsils, but at times comes first on the larynx. In many cases it turns nearly black, gets gangrenous, the breath is fearfully offensive, and the parts beneath and around the spots ulcerate deeply. This is the old-time "putrid sore throat," and is very dangerous. Some of these latter cases start with intense headache, vomiting, and perhaps bleeding from the nose, mouth and other places. Swelling of the glands about the ears and jaws becomes great, swallowing is extremely difficult, and the membrane soon turns dark and offensive, and the nostrils are often involved. Prostration is extreme, almost from the start; the skin hot and then clammy cold, and the face pallid or livid. These are malignant cases, and usually die in from two to five days.

Some symptoms are common, but not at all constant. Muddy and scanty urine is frequent, for a few or many days variable, but not dangerous. Skin heat differs greatly, a high heat or a cool surface being bad. Some have eruptions, for a few hours to three days; varying from minute points like nettle rash, to blotches like erysipelas; mistaken for scarlatina, but lacking the strawberry tongue and not peeling off. Paralysis of different parts may occur six to fourteen days after the presence of the membrane; but sometimes during the attack, again not till a month after. Such paralysis may be in the palate, larynx, eye-lids, face, chest, diaphragm, arms, legs, bowels, bladder, heart. It gives peculiar symptoms according to its locality,—as cough, thick and slow speech, when about the throat; nasal tones and stammering; drooping head; slow and dragging gait, or increasing inability to walk; fatal filling up of the lungs from paralyzed diaphragm; sinking and sudden death at the heart, etc. Paryses coming early are generally recovered from in one to six or ten months; those coming after several weeks, when the patient seems to be completely out of danger, are progressive and exceedingly dangerous. Many times the patient is seemingly recovering but looks very pale; when suddenly the membrane will return, and this a second or third

time. Such returns increase the prostration and are exceedingly dangerous.

Treatment.—Always give a supportive diet easily digested, as broths, soups, beef juice, eggs, etc., well seasoned; with milk, toast, and a little cooked fruit. Digestion would better be aided by a small portion of pepsin in water and vinegar at each meal. Keep the room at 60°, moist, well ventilated. Secure an even surface warmth by moderately warmed bricks or irons or water bottles about the body, and not too heavy clothing. The circulation and general strength must always be sustained, and most vigorously if the surface is cool and the throat yellow or dusky. I generally rely on infusion of the composition powder, weak or strong, as needed, and give one to three or four tablespoonfuls every hour or two. If the membrane is ashy or dark, add two or three teaspoons of myrrh tincture to a small teacup of this infusion. Spray the throat each time after giving this tea with a moderately strong infusion of golden seal, to each two ounces of which add a teaspoonful of myrrh tincture, a teaspoonful of glycerine, and the size of a large pea of borax. For bad cases, a spray may be made of half a teaspoonful solution thymol, two teaspoonfuls each of glycerine and compound myrrh tincture, a teaspoon of table salt, half an ounce of vinegar, and an ounce of infusion of golden seal; used freely every hour. I sometimes alternate this latter spray with powdered sulphur and borax blown in upon the membrane; or even use this each hour, ten minutes after the spray. This is vigorous medication, but is needed. Spraying is easier than gargling or swabbing, and more effective.

A teaspoonful or more of infusion of the Nervine Tonic should be given every three hours, after the third day, and continued through convalescence. Or use the compound tincture Peruvian bark. Stimulating liniment from the head to the small of back may be used on the spine two to four times a day, freely in severe cases, and often averts all paralyses, or cuts them short. Applications of nervine liniment on the throat every six hours, relieve tenderness; or stimulating liniment in severe cases with putrid tendencies. Cayenne pepper sprinkled on fat bacon and tied under the jaws is a family remedy of value, wearing it two hours or less at a time and then omitting it for two or three hours. After the membrane has come away, maintain the strength vigorously with the tonic, good diet, and a moderate use of the composition; avoid all exposure for some weeks; and proceed urgently on any

reappearance of membrane. A little neglect during recovery is often suddenly fatal, and care of convalescence must be very great.

CHAPTER XV.

SMALL POX. VARIOLA.

THIS is the most virulent of the contagions, visiting cities and large country sections at intervals. Previous to the discovery of vaccination nearly every person had it, one in eight of adults died, one in three of children. In Great Britain 45,000, and in Europe 200,000 died from it each year. At one visitation it has almost annihilated some large Indian tribes. Some have had it a second time. I knew an entire family in Central New York to have it twice. Louis XV, of France, died in a second attack. From Turkey, Lady Montague introduced the plan of preparing the system and then *inoculating* with the small-pox virus, which reduced the loss of life. *Vaccination* with virus from kine-pox was found to induce a similar but insignificant disease, that secured considerable immunity, only 1 in 28 of the vaccinated having small-pox, and then in a light form—*varioloid*. A vaccinated person may have severe variola; and some contract it after a second vaccination. I have seen a number of these latter cases, all very severe; and my own case was a fearful one, though a second vaccination with purest lymph had been passed through a few weeks before. When the pustules or pock stand separately, it is said to be *discrete* or *distinct*; when they run together in masses, it is *confluent*, and very much more dangerous. It develops the twelfth or thirteenth day after exposure.

Symptoms.—Languor and poor appetite; followed by shiverings, thirst and restlessness; severe pains in head, back and limbs; distress at the stomach, nausea, probably vomiting; early fever of high grade and strong pulse. Adults may have moments of light delirium; children are usually dull, and may have convulsions. Fever continues unchanged for three days; in which small-pox differs from all malarial fevers, which give some abatement of fever each twenty-four hours.

On the third day, the eruption begins on the face, next on the hands and wrists, in about three days has passed over the trunk

and to the feet. Fever, pains and sick stomach are quickly relieved when the rash appears, a fair perspiration may start, and the patient is likely to sleep well. Rash is most abundant on the face and hands; begins as small red points, raised a little, feeling hard like minute shot under the skin; enlarge by the third day to the size of half a pea, flattened on the top, with a little ring of rose-red inflammation around each. Dating from the appearance of rash, the history is: By evening of the third day, the enlarged pimples begin to fill with a thin, white fluid, and are depressed in the centre. By the sixth day this fluid has turned yellow, the face and hands have swollen, the eyelids are puffy, there has been some throat soreness with viscid phlegm, the eyes have become sensitive to light, the surface stings and itches. On the seventh day the pustules are matured and begin to burst, emitting a very disagreeable smell; and then they slowly dry into brown crusts or scabs, which begin to fall off from the face by the eleventh day. Those on the legs and feet mature and fall off more slowly. By the end of the third week, the whole crop is gone. During maturation, fever again becomes higher, and is called *secondary* fever; the patient is again restless and sleep is disturbed; but the fever is not very high, though this is always a period of weakness and danger. Recovery is now usually rapid; and a good recovery leaves improved health, while a bad recovery leaves weakness and a tendency to glandular swellings and sores.

The above is the current history of a *discrete* case, which is very rarely fatal. A *confluent* case is much more severe in every symptom, though pursuing the same general course. Pustules are common in the throat, with soreness and salivation; and sometimes in the eyes, causing sad trouble there. The amount of eruption on the face is great; the swelling of face and head begins on the third or fourth day, closes the eyes for several days, and makes one truly hideous. The first fever is severe and delirium nearly constant; it is not followed by any distinct period of full relief; the secondary fever finds the system prostrated, is of a low type, and exceedingly dangerous. Odor is more intense; appearances similar to measles or erysipelas may precede the eruption. Bad cases give continuous muttering delirium, or stupor, little or no areola of inflammation around the pustules, dark and tremulous tongue, and probably diarrhea or even involuntary discharges. When these more dangerous symptoms are escaped, recovery is likely to give glandular abscesses or other sores; and the acrid pus

corroding the deeper texture of the skin, leaves pits and white scars that always remain. These may occur in discrete cases. Pregnant women miscarry, and the woman's life is in great jeopardy. Confluent variola is always dangerous.

In *varioloid*, the early symptoms are well marked; but the pustules are few, small, and fall off in four to seven days without any secondary symptoms. Some have the initial fever and pains sharply, but have no eruption whatever. Some cases give a pallid face, and involve the chest in bronchitis or pneumonia, and so prove fatal. Coarse and lymphatic temperaments, the feeble, the ill-fed, drinkers and tainted constitutions have great reason to dread this filthy malady. A *malignant* form is met where blood is lost from the nose, gums, bowels, and womb; the pock contain blood instead of pus, and purple spots appear between the blotches of pock. It is rapidly fatal.

Treatment.—Except as modified by vaccination, attempts to shorten its course and hinder the eruption are futile and dangerous. Better promote full eruption, to save the lungs and nervous system. Abundance of fresh air, disinfection, thorough cleanliness, heat about 60° and good nursing are the first requisites. See the chapter on contagions. A delirious patient may be allowed to sit up, if he desire; but must be guided by gentleness and not by force, and never left alone for a moment lest he escape to the street or do himself fatal injury. One who is known to have been exposed, should use a plain and mostly vegetable diet, and get the liver and bowels well opened. Severe initial symptoms can have an emetic at the start with great advantage. In the first fever, move the bowels with citrate of magnesia, a seidlitz powder, or other mild physic; but give no physic if the bowels are free, and avoid cathartics while the pustules are filling. Cold water may be allowed freely, weak lemonade occasionally; and a small effervescent draught every few hours is grateful and often relieves nausea. Sweating drinks promote the pustulation and soothe the patient. Among these are camomile with spearmint, white root with ginger, or balm, used warm and somewhat freely every couple of hours or oftener. Sponge the face, eyelids and hands frequently with tepid water and a trifle of borax; the body once in twenty-four hours, or every eight or six hours if it is very hot.

In mild cases, little beyond nursing is needed during the days that the pustules are filling. Give sustaining and soft diet, as

broths, soups, eggs, cooked apples and prunes, baked potatoes. Ginger and dioscorea, a tablespoonful of infusion every hour or two, is supportive. Shield the eyes by darkening the room ; but don't make it a dungeon, and never shut out a bountiful supply of fresh air that is somewhat cool. A disinfected room *will not* convey small-pox to outsiders, and probably not to any in the house. If a tonic is needed use a little Nervine Tonic; or add some golden seal to camomile and give every four or three hours; and use large doses right along if the patient get restless, wakeful and weak. For the secondary fever, always sustain with an infusion like ginger and dioscorea, adding five or eight drops compound spirits lavender every hour or two.

In more severe cases, with prostration, use a teaspoonful compound tincture Peruvian bark every four hours, or one-fourth to one-half a grain quinine; and every hour between, give two or three tablespoonsful of composition infusion, adding a very little scullcap. If restlessness and prostration are great, add to this course an injection to the bowel every three hours of an even teaspoonful lady slipper, half as much composition powder and one-fourth of scullcap, in two ounces of thin starch water. Retain by a compress against the anus, if necessary. Gargle the sore throat at any stage with a little borax in sage tea, frequently.

To allay itching and prevent pitting, I pursue the following plan: Sponge the face, neck, hands and any tender places on the hips or shoulders, with an infusion of one ounce golden seal in a quart of water, with an even teaspoonful of borax. Use it tepid and liberally every two or three hours. Then apply a little cream, good lard, vaseline, or goose oil, over the face and neck, to protect the skin completely from the air. Every twelve hours, beginning on fourth day of eruption, puncture the pustules with a needle, and gently press out the matter in them with a cloth wet in the wash. These pustules are in several sections around the flattened centre; and to open every section, pass the needle in three or four directions, parallel with the surface and completely through. Follow with a wash of weak borax water to remove the pus, and then with the above wash. I discovered this use of golden seal in my own case in January, 1850. It soothes and sustains the tender skin under the acrid pus, relieves the itching and the restlessness this causes; and thoroughness in this plan has been so effectual with me, that my small-pox patients escape this terrible irritation and rarely have a discernible mark left. Watch the eyes carefully,

to cleanse the edges of the lids and remove any pus that gets under them, for which a weak wash of golden seal without borax may be used three or four times a day.

During convalescence, give a pretty generous diet, keep up tonics as long as needed, treat abscesses or glandular swellings with compound yellow dock syrup, cut off the hair instead of attempting to save it, and give tepid baths two days apart for a couple of weeks to remove everything from the surface. All cloths, clothing and bedding used about such a patient should be burned or deeply buried. There need be no apprehension that burning it in the open air will convey the disease to others, for fire at once destroys all power of contagion.

CHAPTER XVI.

VACCINATION.

In the latter decade of the last century, the practice of vaccination to modify or wholly prevent small-pox was introduced in England by Dr. Wm. Jenner. Small-pox was exceedingly prevalent throughout Europe, and very fatal. No person, of whatever estate, expected to escape it. By pretty thoroughly cleansing out the system and then inoculating with it, the disease was rendered milder, and so this course had become somewhat general; yet it really multiplied the disease and increased the amount of the virus. With the best care, small-pox in Europe was a fatal and a dreaded scourge.

Under these circumstances, Dr. Jenner was informed incidentally, by an agricultural laborer, that those persons who milked cows occasionally got a species of pox (pustule) from the udder of the cattle; and those who contracted this pox rarely would contract the small-pox, and would have the disease in a very light form if they did contract it. He became interested in this statement, and at once proceeded to investigate its correctness. It was found to be true, and a fact pretty well known among farm laborers. He reasoned that, if the pus accidentally found on the udders of a few cows and from them conveyed to the hands of milkers would thus check the violence of small-pox, why could not the whole family of man be similarly protected against this loathsome

disease by inoculating them with the pox of the kine. In due time, and after careful observation, this thought was tested and proved to be correct; and thus was introduced the practice of vaccination, in 1796.

The advantages accruing to the human race through this discovery, are simply incalculable. When one takes into consideration the universal prevalence of small-pox before the introduction of vaccination, and the expense, filth, labor, sorrow, disfigurement and enormous mortality caused by it; and contrast these facts with the present limitation of that malady, its mild form and insignificant death-rate, some idea may be formed of the benefits of vaccination. And yet it cost a long and severe struggle to establish it among the profession, who exhibited toward it the same bitter prejudice that they have exhibited toward every new measure offered for the improvement of their art. Instead of investigating the plain facts with the purpose of utilizing them for the benefit of mankind, the physicians as a body at once proceeded to arouse public prejudice against the whole subject, seeming to prefer that the filthy scourge should continue to sweep away its victims at the rate of 200,000 every year. They also assailed Dr. Jenner, a learned and honorable member of their own fraternity; and oppressed him personally till they for many years almost ruined his business and kept him in hard poverty. This was the same course the profession of a previous century pursued toward their highly educated brother, Dr. Wm. Harvey, when he demonstrated the fact that the blood circulated through the body. It is the same course that is pursued, in our own day of boasted enlightenment, toward every man who offers this profession a great and useful thought for the benefit of humanity. The new thought or practice is condemned without investigation; and the man himself is treated as an outcast and if possible driven to want, until such time as his discoveries force themselves into public acceptance. This universal spirit of bigotry and oppression among physicians is most deplorable, and hinders enlightened progress to the serious detriment of the people and the loss of life.

Before vaccination was practiced, only a moderate number of the total population of England, Ireland and Scotland escaped having small-pox. Now, only one person in every twenty-eight of the vaccinated has it. Of those who contract small-pox, an average of 35 in every 100 of the unvaccinated (for some people still neglect to be vaccinated) die; while of those who have been

carefully vaccinated yet are attacked, only 6 out of every 100 die, even in severe epidemics, and 3 out of every 100 in a series of years including cases in hospital and those in private practice. From an annual death-rate of about 45,000 from small-pox in Great Britain in the past, vaccination has reduced the figures to less than 600 deaths a year from small-pox, and this with a population half as large again as it was prior to Jenner's discovery.

Whether the disease causing pustules on the cow's udder is real small-pox, and its introduction to man prevents further small-pox as inoculation does; or whether it is a different yet quite similar disease, protecting by a resemblance to small-pox, has not been determined to the satisfaction of all. Nor does it especially matter; for we are most concerned in the humane facts that the kine-pox working through the human system protects the great majority of men; that it greatly modifies the small-pox in the very limited number who contract it after being vaccinated; and that very few men of this limited number die.

It is not at all necessary that the lymph or pus used in vaccination should be obtained directly from the cow. Very extensive observations have been made on this question; and the best information shows that the virus may pass from person to person almost indefinitely, without losing its protecting potency. That directly from the cow causes the greatest disturbance in the system, without apparently increasing its benefits. That from the heifer, now commonly obtained from "vaccine farms," is not found to be as protective as lymph that has long passed from arm to arm. That which has recently been humanized, which has had but a few removes from the cow, is probably the most active of all.

Much apprehension has been stirred up, lest the use of humanized lymph should transmit skin diseases and serious constitutional taints. This idea has sometimes been adroitly fostered by parties having a pecuniary interest in a "vaccine farm." The facts cannot be said to justify this apprehension in the most remote degree. It is possible, out of millions of cases, that one might *seem* to convey a human taint from person to person; but so might disease be conveyed from the cow in even a larger percentage of cases, for cattle in the best rural districts may become diseased. If the vaccinated person already have some skin disease, or is strongly scrofulous, or has become gross by ill habits, or is tainted with syphilis, or has a latent tendency to erysipelas, then may vaccination prove a means of provoking these into active development.

Facts of this kind have been noticed, where the same vaccine caused no trouble whatever to a score or more of other people on whom it had been used; or where the lymph used was obtained directly from the cow, and one person suffered while others using the same pox did not suffer. Manifestly the blame is to be placed against the state of that person's system at the time of vaccination, and not against the practice of vaccination. Yet it is proper and right that the greatest circumspection should be exercised in selecting humanized lymph, that from young and healthy children, free from all signs of skin irritation or eruption, being alone used.

Fresh lymph, that which has dried by keeping, or the scab moistened with tepid water so it can be absorbed, is equally effective. A scab or lymph which has been kept a month, is quite uncertain. Lymph obtained about the ninth day after vaccination, and dried upon the point of a quill, seems to be introduced to another person most easily. The amount required to be introduced is exceedingly small.

It is preferable to vaccinate children when young,—a few weeks old for the robust, a few months old for the more feeble. The virus may be inserted anywhere, the side of the arm and near the shoulder being the sites usually chosen. Fresh lymph, from arm to arm, is usually conveyed most easily and absorbed most rapidly. If dry lymph upon a point is used it must be moistened for ten or fifteen minutes with drops of tepid water, so as to be softened thoroughly. If a crust or scab is employed a small piece must be moistened till thoroughly pasty.

To secure absorption the skin is to be punctured or abraided or scratched with any pointed instrument, enough barely to reach the blood without causing any flow. The lymph or pasty crust is then to be introduced to this spot, wetted so as to insure its remaining soft for twenty or thirty minutes. It is always advisable to make at least three such insertions of the virus at separate points yet quite near each other; and this constitutes really effective vaccination, and makes reasonable provision for the absorption of at least one of the applications.

No particular effect is noticeable till after the second or early in the third day. If the virus has been absorbed, the parts will then present a red point at each place of absorption. This red point goes on enlarging and brightening, becomes slightly elevated, by the fifth or sixth day shows a pale milky fluid in it and is depressed in the center, and by the eighth day has attained its full

size. A bright ring of inflammation extends around this vesicle, with a diameter varying from one to three inches, tender, sometimes painful and hard, swollen. Sometimes there are several vesicles, or two or three may run together. About the tenth day this inflamed areola begins to fade, and has usually disappeared by the thirteenth day. At the same time the vesicle dries, and by the fourteenth or fifteenth day is a hard brown scab, which by the twenty-first day has darkened, contracted, and fallen off. Under this scab is left a cicatrix, circular, depressed, pitted, and remaining perceptible for many years or possibly for life.

While these local changes are going on, some constitutional symptoms are probable. In many cases these are so slight as to scarcely be noticed; but very many times there is distinct feverishness and restlessness, beginning about the fifth day and continuing till the areola subsides, often with headache and disturbance of the stomach and bowels. In some, the glands in the axilla inflame and swell while the areola is at its height; and occasionally some eruption or even vesicles appear over the body, especially on the extremities. Some persons hastily conclude that such eruptions are proof of impure and damaging vaccine, but this is not the fact.

When vaccination pursues the above course in the several particulars, admitting only a delay of one to several days in the development of the pustule, it is as potent as possible in the prevention of small-pox. It is "regular" and reliable vaccination. But there is a course following vaccination at times, which is of no value as a preventive of the disease. In such cases the vesicles start early and with irritation, or may begin to die away by the fifth or sixth day, and become a thin scale by the eighth, or be pointed instead of flattened, or contain an opaque straw-colored fluid instead of a clear lymph; or may burst by the eighth day, and leave a scabby appearance or open sores. Such cases are called "spurious," and are not to be relied on.

With, probably, a majority of persons, a good "regular" vaccination serves as a protection through the whole life. With many others, the protection does not seem to extend beyond puberty; while a limited number of persons are subject to even a second or third attack of small-pox itself, and the protection of vaccination is not durable with these. It is not possible to know who these persons are, as there are no signs to denote them. On these accounts, it is usually advisable to practice a second vaccination after the lapse of several years; or even upon the occurrence of

every sharp epidemic of small-pox. Each such vaccination should be performed with as much care as the first one ; and each constitutes a reasonable test of the susceptibility of the system to small-pox. If the cow-pox does not influence the system, it is commonly believed that small-pox would not influence it. If the cow-pox produce its usual manifestations, it is considered that small-pox might have attacked that person had he been exposed. Re-vaccination thus secures a feeling of safety at moderate expense. Yet vaccination does not provide absolute immunity to every person and under all circumstances ; and re-vaccinations may fail in the same manner, and be followed by small-pox in very severe forms (p. 275).

CHAPTER XVII.

CHICKEN POX. VARICELLA.

THIS eruption belongs mostly to children, and is often epidemic. Four or five days after exposure, scattered and small round pimples appear on the face and body, but are not hard and deep under the skin like small-pox. On the second day they are filled with a milky fluid ; and in two or three days more they dry down and soon fall off. They never flatten nor indent on the top, nor fill with yellow pus, nor leave any pitting, as small-pox does ; they may appear in two or three successive crops ; and there is no fever or other disturbance to any material extent. It only requires good housing, quietly moving the bowels by magnesia or neutralizing cordial, and a light diet.

CHAPTER XVIII.

TYPHUS FEVER.

CONFUSION exists between this and typhoid, which are thought to be different forms of the same disease, but are different maladies. Typhus is not so common in the country as in towns and cities ; women and children are oftener its subjects than men, but a larger percentage of men die from it ; having entered a family, there is a

strong probability of its attacking all the members of it; and one attack commonly gives future immunity, though in rare instances persons have had a second attack. It occurs chiefly during the winter, when doors and windows are closed against cold weather. Crowded houses, tenement houses of cities, camps, emigrant ships, jails, small country houses occupied by large families, and other positions where many people live together under circumstances of, restricted ventilation and accumulated animal waste, are the seats of typhus. It is hence called a "filth disease"; and its appearance and spread are preventible by reduction of tenantry, scattering the family, purification, and bountiful ventilation (p. 22).

It is moderately contagious, but probably not beyond three or four feet distance from the patient. Its emanations appear to be from the lungs rather than the skin, are not strong, and are rapidly diluted and rendered harmless by a free circulation of air. Sometimes it is epidemic, extending its visitation over a period of about three years, lighter in summer than winter. Ill-fed portions of a city population suffer most, but these are also the over-crowded portions. Homes in a healthful country are scenes for it when the rooms are very small, too low in the ceilings, and kept too hot and close.

Symptoms.—These are steady and prolonged, usually occupying three weeks, and marked throughout by great debility. One or two days of dull headache, and loss of appetite, and feelings of fatigue in body and mind, may precede the onset. It may then develop gradually, or set in quickly with a light but prolonged chilliness, increasing headache of a dull character, sense of heaviness and listlessness, indisposition to think or talk, a dull and somewhat stupid expression, and a dusky flush over the whole face. Fever follows the chill and rises slowly, the skin having a pungent heat but the pulse being small and weak. The tongue trembles, is muddy-white and dry; thirst urgent for small amounts very frequently; patient lies on the back, and soon slips upon the back again if turned upon the side; bowels persistently constipated and urine very scanty.

For about one week these symptoms get steadily worse. From the fifth to the eighth day an eruption usually appears as small, round, dusky spots, just upon the surface without being raised. It is mostly on the upper and middle abdomen, extending a little upon the chest; in a few cases abundant and reaching the extremities, oftenest but scanty and possibly mingled with little red points,

sometimes wholly wanting. It remains out the second week; and during that week the patient's symptoms are worse, probably including stupor, muttering delirium, brown and very dry tongue, increased prostration, very rapid pulse, (120 to 140), dusky face, impairment of sight and hearing. This is the week of danger, especially from the eleventh to the fourteenth day. After the fourteenth day and on to the twenty-first, the tongue moistens and cleans off, the mind clears up, fever leaves, the bowels and kidneys are more free, and with these signs the patient is on the way to recovery. Mild cases do not give all the symptoms in severity; but bad cases present them all, and are liable to include severe lung congestion. It always leaves a patient greatly prostrated, and convalescence is slow for several weeks.

Treatment.—By no possibility can typhus be hurriedly "broken up," though exceptionally mild cases pass the height by the twelfth day and recovery is fairly advanced by the fifteenth. Nowhere are the effects of careful nursing more decided,—fresh air in a large room, even warmth, quietude, cold water freely in small quantities, light feeding of broths and gruels, tepid sponging of the entire body every twelve hours with the least possible handling, gently turning the patient on either side betimes to relieve the lungs and prevent bed sores. Liquors are often deemed a necessity here, if nowhere else; but they are totally unnecessary and actually injurious, as noted in the chapter on alcohol; and there are plenty of sanative stimulants to sustain the heart and nerves and secretions.

Give a dose of leptandrin every twelve hours, and in each dose half a grain of cayenne, using enough to get one fair movement of the bowels each day and to keep a steady action on the liver, which actions are imperative from first to last. Two discharges a day of tarry faeces are encouraging in the second week. Every three hours give two grains of scutellarin and half a grain each hydrastin and cayenne. Every hour give two to four tablespoonfuls of an infusion made of one part each ginger, white root and lady slipper. Water of cream-of-tartar may be given *part* of the time as a drink, a tablespoonful or two at a time; and to avoid continuity of this, it may be replaced by a weak and cold tea of spearmint or balm, and again by weak lemonade.

In the second week, if stupor increase, add one-twentieth part of cayenne to the above warm infusion; use Nervine Liniment along the spine twice a day; sponge only the face with tepid water;

put on the soles of the feet flaxseed or mush poultices sprinkled liberally with cayenne and then wetted, and keep on two hours at a time and remove for four hours ; keep warm jugs or irons at the feet. Food can scarcely be taken ; and if not, give barley-water injections every three hours. Apply Stimulating Liniment over the stomach every six hours ; cleanse the mouth with weak vinegar and water, or with weak borax water, every couple of hours ; if the patient does not call for drink, moisten the lips and mouth at least every hour, and by thus partially rousing him give a little water and occasionally the cream-of-tartar water. If there are muttering and twitching, give each three hours in the barley-water injection an even teaspoonful of lady slipper and half that amount of dioscorea, to be retained, alternating these with the scutellarin powders ; and enlarge the size of the leptandrin powders so as to make sure of two evacuations each twenty-four hours. As the disease is slow in its course, the medication needs to be steady and persistent.

CHAPTER XIX.

TYPHOID FEVER. ENTERIC FEVER.

THIS differs from typhus, though in some cases the two maladies seem present together. It is also a "filth disease," not spread by way of the atmosphere so much as by contamination of drinking water and milk, by discharges from the bowels of typhoid patients, etc. (p. 58). Such discharges if cast upon the ground may find their way into wells and streams ; and an exceedingly minute portion appears to be sufficient to cause the disease. Milk diluted with such water may extend it to many families ; and foul sewage or privies may also contaminate drinking water. Some persons and families are very susceptible to it ; others never have it, though probably exposed. It is most common among the middle-aged and young, less among the old ; appears oftenest during autumn, and may be severely epidemic ; and is most violent among the over-worked, debilitated and ill-fed. By vigorous hygienic measures an epidemic may be cut short effectually.

Symptoms.—It develops slowly, from ten to twenty or thirty days being occupied. Invasion is at times abrupt, giving sharp

headache, chill, and great depression; but usually it is insidious and slow. Some bleeding at the nose, loss of appetite, an "out of sorts" feeling, dull and slowly increasing headache, and one or two quite thin and peculiar smelling discharges from the bowels each day, are among the earlier symptoms. Rarely, very rarely, are the bowels confined. In a few days there is a slow rise of fever preceded by cold sensations down the back, light flush upon the cheeks, prostration, slight soreness of the throat and a small cough, muscular pains as if a cold had been taken, moderate and moist fur upon the tongue. Such signs usually advance for a week, with some fullness of the abdomen, some tenderness in the right groin on pressure, probably some gurgling if the flat hand is pressed gently on the abdomen. Perhaps the patient does not go to bed for a few days; the flushed patch on each cheek is bright, the fever is not intense but is notably higher later in the evening than the morning, urine scanty and muddy, tongue pointed and red at the tip and edges. The faecal passages, which may vary from one to more than a dozen in a day, are watery, rather large or even copious, of a strange sickening odor, varying in color from light yellow to dark green or drab, and some flocculent material in them.

During the second week the patient lies mostly on the back, looks worn and thin, trembles in the hands and lips, sleeps little by night and more by day, is for a moment confused on waking and gradually rambles in mind, has some deafness, answers questions slowly. Abdomen larger and more tense, tenderness and gurgling more distinct, diarrhoea probably more troublesome, fever as before, tongue with a brown streak in the middle and angry tip and edges. Small pink and slightly raised spots, round or oval, scattered over the abdomen and chest, appear this week and continue to come out in successive crops to the end.

About the end of the third week he is at his worst,—weak, listless, half unconscious, more deaf, perhaps restless and muttering, or sleeping half stupidly with the eyes partly open; face thin and wan, pale or dusky; skin thin and harsh; muscles wasted, trembling and twitching; tongue shriveled, dry, brown or glassy red, perhaps it and the cheeks and lips covered with black crusts, trembling, protruded with difficulty or not at all. Heart action is feeble, the pulse soft or very frequent (130), abdomen greatly distended and drum-like, lungs showing signs of congestion. If the patient is improving, at the end of the third week the tongue moist-

ens, pulse improves, abdomen begins to subside, fever lowers, diarrhoea ceases, and strength returns little by little. Black tongue, stupor, prolonged wakefulness, greatly distended abdomen, twitchings, hurried breathing and other lung troubles, are each and all exceedingly dangerous signs.

Relapses are common after this fever, often due to using solid food too soon; a second or third one sometimes occurring, and always adding gravely to the danger. Bleeding from the bowels may occur, usually in the third or fourth week, sometimes as early as the tenth day, occasionally as late as the fifth or sixth week. It is always very prostrating and highly dangerous,—caused by ulceration of patches of the bowels (peculiar to this disease) becoming deeper, and sometimes destroying through the bowel. It takes a long time for such ulcers to heal, hence full recovery is exceedingly slow. Variations in this current history are not infrequent. Some have no diarrhoea, but constipation; some do not take to bed until the second or third week, this being highly dangerous; bilious vomiting with paleness and little fever occurs in some, and is very serious; at times a profuse eruption will extend from head to feet; dangerous stupor attends some cases.

Treatment.—So far as possible, these patients are to have a large, well-ventilated room, with doors well open; a firm mattress with a cotton covering, light bed clothing, and skillful nurses for day and night. Nowhere does good nursing show its value more conspicuously. Sponging with tepid water, varied in heat to suit the feelings of the patient, should be practiced every night, or night and morning, and may possibly be repeated through the day to relieve great heat and restlessness; but frequent tepid spongings of face and hands are usually preferable to too many general baths. All bathing should be done *gently*, uncovering and sponging but a part of the body at one time, and drying with the least possible friction.

Diet should be regulated carefully, and scrupulously limited to liquid foods. Milk is altogether the most desirable; oatmeal gruel, beef tea, barley water, and the concentrated water from boiled oatmeal diluted, being used occasionally in alternation with milk. Food should be given with exceeding regularity, usually every three hours, possibly every two hours if the prostration is considerable in the second or third week. Three to five tablespoonfuls of milk are sufficient at one time; and even this quantity must be reduced and mixed with a teaspoonful of lime water, if curd is seen

in the passages. Generally these patients are fed too much, greatly to their injury. Cold toast water, or water off of popped corn, is a suitable drink and nourishing. Beef tea sometimes increases diarrhoea, and then must be withheld. A bed-pan should be used for all the evacuations, for it is exhaustive to the heart and sometimes immediately dangerous for these patients to rise to a vessel. When the patient is convalescing, a change to solid diet should be made very slowly and with extreme caution,—disregard of which rule has cost many a life. Part of a softly cooked egg, a bit of soft milk-toast, and a piece of baked potato, are among the most suitable solids to be ventured upon,—at first in a single meal per day, and after a few days increased gradually.

Very little medicine is required, and this only in one-fourth or less of the usual doses. A dessertspoonful of weak infusion of white root every two hours will help to soften the skin. A teaspoonful or two of weak cherry-bark infusion every four hours will soothe the bowels and limit ulceration. For the diarrhoea, half a teaspoonful of Neutralizing Cordial may be added to the dose of cherry. Bathing the abdomen every six hours with Nervine Liniment, then laying on a thin piece of flannel wrung lightly from hot water and covering this with two thicknesses of dry flannel, generally relieves soreness and tension. When prostration is considerable in the second and third weeks, some ginger and a little flaxseed may be added to the white root infusion, and this given every hour; and a very little golden seal added to the cherry infusion, and continued every fourth or third hour. All these infusions are to be weak, and I greatly prefer infusions to any other form in which medicines can here be given. Continuance of these measures must thus be gentle and steady. Bed-sores must be anticipated by shifting the patient's position gently from time to time, and frequently washing the exposed points.

Bleeding occurring from the bowel demands the utmost stillness of the patient, and his quiet but determined resistance of the desire to evacuate the bowels caused by the presence of blood there. A light poultice over the abdomen of flaxseed mixed with a large portion of lady slipper and a little ginger, often lessens the movements of the bowels and allows a clot to close the bleeding vessels; so may a small bag filled with pounded ice laid for a time in the right groin. *Small* injections of a *strong, cold* infusion of cherry bark, or of witch-hazel leaves, is often a most effectual check to further bleedings; and may be repeated every three to six hours

and retained, but on no account must they be large, or mingled with such astringents as will excite the bowels to move.

CHAPTER XX.

MENINGITIS. SPOTTED FEVER.

FREQUENTLY known as Cerebro-spinal fever, and formerly called Black Tongue. It has appeared as an epidemic for several centuries, the first recorded American visitation being in the New England States in the winter of 1806-7. It occurs often in the winter and spring months, usually as an epidemic slowly moving from place to place over a wide area, many times not epidemic. It is in no sense contagious, though conditions of human crowding—as in camps—at times seem to promote it; but its cause is unknown.

Symptoms.—It is practically an inflammation of the coverings—meninges—of the brain or of the spinal cord, or of both; and is liable to involve the brain itself in this inflammation, and sometimes the spinal cord also. It begins suddenly in nearly all cases, with sharp and darting pains in some portion of the head, extending down the back of the neck; slight chilliness, feelings of apprehension perhaps amounting to terror, early prostration. Nausea and probably vomiting usually appear soon; very severe cases pass quickly into delirium and then stupor; in rare instances there may be spasms almost at the outset; occasionally one rushes through these symptoms so rapidly as to be overwhelmed and die in from four to twelve hours.

The more usual history, however, develops moderate fever after the first few hours, with increasing restlessness, wakefulness, extreme sensitiveness to light and sounds, great annoyance at being touched or jarred or hearing conversation. Eyes suffused, head continuing to suffer terrible and darting pains, head hot and feet often cold as marble, tongue pointed and trembling and slightly furred, urine pale, bowels generally very constipated. Some go through the entire attack with few other symptoms, recovering slowly with much brain sensitiveness. Others in from two to four days become painfully sensitive to touch over the entire body, the spine is peculiarly sensitive, twitchings are common and are in danger of proceeding to convulsions, wandering of the mind may

precede these or pass into lethargy or heavy stupor. These convulsions are not common in adults, but are most frequent in youths and young children; and are peculiar in the suddenness of their onset and recurrence, usually drawing up the limbs and so lifting the body that the patient rests on the buttocks and back of the head. In some cases, by no means the majority, an eruption may appear from the second to the fifth day, chiefly on the chest and limbs, in size from a pin's head to half an inch or more in diameter, in color from a clear red to a purple or almost black,—the darker tints signifying great danger, and sometimes continuing after death.

Whether or not there have been convulsions, the following symptoms are likely to appear in protracted and severe cases: The pupils are liable to vary in size and show insensitiveness to light; the tongue becomes heavily coated, muddy, brown, or black; respiration is irregular and often sighing; temperature variable, the extremities usually very cold; pulse variable and generally weak; the abdomen often sinks in and the eyes remain partly open and turn upward. Swallowing becomes difficult from partial paralysis; and such paralysis may be found in one arm, one side of the neck, down one side of the body, or other section; and also may visit the bladder and lower bowels, either causing involuntary evacuations or arresting all discharges.

Death is most probable with the latter class of symptoms; but I have saved many after convulsions, stupor, and partial paralysis. Recovery is exceedingly slow, convalescence for months being marked by great sensitiveness and irritability, fatigue on moderate exertion or thought, intense and throbbing headache on trifling excitement. Children may seem to be recovering, but are subject to sudden seizures of screaming from intense pains in the head; and may gradually pass into pallor, lethargy, convulsions, and death after some weeks.

Treatment.—Quietude of the most extreme degree must be maintained, not merely in the patient's room but throughout the house. Every movement must be the gentlest possible; and talking or whispering in the room or to the patient must not be allowed. If an excited patient inclines to constant talking, he must be quietly discouraged from it. Admit but one person at a time to the room, and keep the apartment darkened and at a very even temperature. Gruels and soft foods only should be given, and these in small portions, at intervals of three or four hours.

For the vomiting, give the soda hyposulphite solution, a tea-

spoonful every two hours or hour. An infusion of two parts white root, and one part each ginger and lady slipper, a tablespoonful every hour, is very soothing and also cools the skin. If the feet are cold, bathe them every six or four hours, gently, with warm water containing some salt and a little red pepper, and keep to them a warm brick or iron. Once in three hours, a powder of two grains cypripedin and half a grain cimicifugin may be given, to great advantage. Sometimes it is well to sponge the spine with rather warm water, and then apply the nervine liniment its entire length, once in eight or six hours. But it too often worries the patient to be handled at all, and then it will not be proper to make any spinal appliances whatever.

I am extremely partial to the use of enemas in this malady, limiting thereby the medication to the stomach. A heaping teaspoonful of powdered lady slipper and half that amount of lobelia, given every two or three hours in two or three ounces of thin barley or starch water, is at once nourishing and soothing, and acts finely in lessening the brain excitement and averting spasms. They are usually retained well, and may be continued steadily. Should spasms appear, the amount of lobelia should be doubled, one-fourth or more of a teaspoonful of blue cohosh be added, and the enemas given every hour or two hours as needed. If the secretions become offensive and the tongue dark, use two grains of powdered myrrh in the enemas first named. The benefits of this course are truly remarkable; and by it I have saved many a precious life that otherwise was entirely beyond hope. It is a novel practice, but from long and abundant experience I can insist on its great efficacy.

At the outset, it is advisable to move the bowels with magnesia or a seidlitz powder, or to give a full dose of leptandrin if the liver is torpid; but physic is not usually called for at all during the malady. I am greatly opposed to any use of quinine in this disease, its action being in my judgment totally unsuited to the nature of the malady. Convalescence must be watched with the greatest care, and for a long time. A tonic preparation of two parts cramp bark, and one part each camomile, lady slipper and queen-of-meadow, in the form of a syrup or infusion given four times a day, is quite suitable. Let the diet be plain and light; and keep the liver in very gentle action by adding some wahoo to the tonic, if needed. Brain and body must have a long period of rest to insure a good recovery, return to brain work or the cares of business being especially exhaustive and dangerous.

CHAPTER XXI.

MALARIAL DISEASES.

MALARIAL diseases embrace Ague or Intermittent Fever, Remittent Fever, and others, of which descriptions will presently be given. All have the distinct peculiarity of returning paroxysms of fever, which appear and re-appear with almost clock-like regularity. This periodicity also stamps itself upon other maladies where a malarial influence exists, as neuralgia, dysentery, typhus, etc. While the typical malarial diseases have variations in parts of their history, they all tend to the reduction of the system; the simpler forms may pass into the severer in cases doing badly; the severer may have the history of the simpler when progressing favorably.

Malaria, or the *malarial poison*, must be a specific influence, though its real nature has been in dispute. It is generally conceded to be of vegetable origin; rising into the air when such vegetation has decayed by exposure to the sun in summer. Recent observations convey the impression that it is an accumulation of minute fungi or spores; and if these be introduced into the blood a malarial disease will ensue, or if soil impregnated with them be conveyed to non-malarial places the characteristic malarial diseases will appear in these places.

It has been found that a heat of not less than 60° F. must continue for at least three weeks, to develop these diseases. Sharp frosts arrest them, but those afflicted may have a recurrence in the warmth of next spring. Hence they are autumnal fevers; and are most protracted and violent nearest the tropics. They prevail only in certain localities, other locations being utter strangers to them except as cases come from abroad. Marshy districts are their principal sites; very level sections, especially with an alluvial soil; low grounds subject to inundation and afterward to drought; high grounds that are drenched by irrigation and then become dry. Rich soils, when first upturned to the sun by cultivation, may be followed by sharp malarial diseases where none existed before; and ponds, mill-ponds, small lakes, and similar bodies of water, when drained so as to expose to the summer heats the organic material that has gradually accumulated in the soil at the bottom, suddenly develop severe malaria. So long as a marsh or pond is fully covered with water, malaria is seldom to be feared.

It is rare on the seashore, and only when fresh-water streams mingle with the sea-water on marshy places that are drained as the tide goes out. Continued cultivation, especially if aided by underdraining, will obliterate it from a locality. It does not appear in the crowded parts of large cities, though previously common there and existing around the sides. Night fogs appear to concentrate it and to increase its activity, and persons in malarial districts living above the fog-level commonly escape. Yet a wind sweeping over a malarial tract and up a ravine, has been known to develop malaria in persons living far above the source of the poison; and gentle winds may carry it some distance along level ground. It is intercepted by hill ranges, thick bodies of timber, and an open body of water—especially running water.

Some persons are more susceptible than others to this poison, blacks less than whites. Liability to malarial seizure is increased by recent arrival in a malarious district, fatigue, nervous exhaustion, mental depression, intemperance, exposure on an empty stomach, exposure to full heat of the sun, chilling the surface suddenly, night exposure, etc.

The influence of malaria is largely upon the nervous system, which it lowers in tone and greatly disturbs; upon the spleen, often leaving it enlarged and hardened for a long time; upon the liver, which it inclines to severe congestions; upon the blood, which it greatly reduces in red corpuscles and nourishing power. Though an attack be broken, it is liable to return at intervals of every seventh day from the last paroxysm during warm weather, or to lie latent through the winter and return the following spring. A single attack may show its bad influence on susceptible persons for several years, even though they remain in the malarial district but a few weeks; though removal to a healthful district usually relieves the system in two seasons. Continued subjection to its influence works grave damage to the constitution, marked by thin flesh, an old and withered look, yellowish brown skin, strong liability to neuralgias, impoverished blood and disturbed heart action, insufficient strength, dropsical tendencies, etc. A distinctly malarial locality steadily deteriorates the human race, makes each succeeding generation feebler and shorter-lived, and in most men finally causes impotence.

Danger from malaria may in a measure be guarded against, by large wind-breaks, underdraining, thorough cultivation of the soil, and by carefully remaining in-doors till after sunrise and after sun-

set,—with a little fire on an open hearth all the time. This last course seems to save most persons even in very bad districts. It has long been believed that a free cultivation of sunflowers around the house will arrest it; and the cultivation of the eucalyptus (blue-gum) tree in malarial marshes is conjectured to be prophylactic.

CHAPTER XXII.

AGUE. INTERMITTENT FEVER.

THE most common of the malarial diseases, as above. Its symptoms are divided into three stages: 1st. Cold, or chill stage. 2d. Hot, or fever. 3d. Sweating. The time between the third stage and the beginning of another cold stage, is the *intermission*; the three stages taken together constitute a *paroxysm*. A paroxysm may be suffered every day (twenty-four hours), or every second day (forty-eight hours), or every third day (seventy-two hours). Whichever variety a case assumes, it usually continues so throughout. It returns with great regularity until broken, the cold stage reappearing almost to the minute. If the return of the first stage of a paroxysm is delayed, it is a favorable sign; if it return before the expected time, it is unfavorable. It may begin at any time in the day, but is quite rare at night after one gets asleep; but an evening paroxysm delayed till the patient is asleep, is likely to return as soon as he wakens during the night or early next morning.

Symptoms.—Most patients have a premonitory condition, with languor, loss of appetite, furred tongue, aches through back and loins, irritable stomach, some nausea, constipation, frequent passages of pale urine, and dull headache. These may continue for one or several days; and the first paroxysm of the attack is not so distinct in its symptoms as the second or third.

The *cold* stage begins with yawning, stretching, creeping sensations along the back, foul tongue, pale face. In a short time chilliness extends over the whole body, with shiverings, chattering teeth, shrinking of the skin, blueness under the nails, a rapid pulse, and hurried breathing. Headache, thirst and drowsiness are common; sometimes there is vomiting; no amount of covering or outward warmth will relieve the distressing sense of coldness

and depression; which may continue from a few minutes to one or two hours, the average being from thirty to forty-five minutes.

Heat gradually succeeds the coldness, beginning about the face and gradually extending over the body, the shiverings becoming lighter and more interrupted till they disappear. A high flush succeeds the pallor of the face; the pulse enlarges and beats strongly, the skin becomes intensely hot, vomiting of bilious matters is not uncommon, urine scanty and high colored, headache violent and distressing, occasionally some delirium. This *hot* stage may continue from one hour to twelve or eighteen hours, the average being from six to nine hours.

Succeeding this fever is the *sweating* stage. Gradually the face becomes a little moist, headache lessens, restlessness and vomiting cease, the sweating steadily extends over the body and becomes profuse, the pulse rapidly lowers, the patient is disposed to fall into a quiet sleep, during which the signs of fever disappear, the skin becomes cool, and the urine again becomes free but with a brick-dust sediment. No definite time is occupied by this stage, which brings full relief; and the period of intermission that ensues between this and the next chill may seem one of complete ease and health, except for a moderate sense of fatigue and "laziness."

Either one of the three stages may be indistinct. When the cold stage amounts to no more than a period of severe yawning and stretching, it is called "dumb ague." Paroxysms of pain in any part of the body may take the place of the cold or hot stage, or of both. If the cold stage is greatly prolonged, or return long before its regular time, and is accompanied with great restlessness, an incoherent or wild delirium, sighing respiration, sunken eyes and extreme shrinking of skin on the extremities, and a small and exceedingly rapid pulse, it is called a "congestive chill." Fever then develops very slowly and reluctantly, there is serious depression of vital power, and a third recurrence of "congestive chill" is occasion of the gravest alarm. If bronchitis accompany ague, it is a misfortune; if pneumonia develop at the time, it is dangerous to the highest degree; an incomplete relief during the intermission, or heavy drowsiness, or a dark tongue, is likely to forerun death, especially in the old or feeble. Fortunately such complications are not common; and few die directly in an ague, though many slowly and inevitably succumb to protracted malarial influences.

Treatment.—It is imperative to remove constipation, and to

evacuate liver and bowels; but physic should, if possible, be given so as to have finished acting several hours before the time of next paroxysm. Antibilious physic with cream-of-tartar is suitable to start with; and afterward keep up action with compound leptandrin pills, two evacuations a day being advisable. Little can be done during the first paroxysm, but its return should be prevented as actively as possible. Beginning near the close of the sweating stage, give the Ague Tonic or the compound Gentian Syrup every three hours. By its vigorous use, quinine will be nearly or wholly dispensed with, if the bowels are kept steadily open. Yet it is advisable, until one chill has clearly been missed, to give some quinine. I generally advise pills or capsules in doses of two grains, beginning four hours before the time for a chill and repeating every hour for four hours,—thus giving the last dose an hour before the chill. Or the time may be arranged to give the last dose half an hour before the chill. Weak and sensitive persons will not need more than half a grain to a grain of quinine in each dose. Its action may be hastened or distributed by adding a grain of hydrastin (or hydrastia sulphate) and a half grain of cayenne, to each dose of quinine in a capsule. If the feelings in the head make quinine objectionable, as is common, salicin may be used in doses twice as large. I have many times had complete success in breaking chills in bad cases by giving a drachm of fluid extract of gentian and a grain of cayenne in a small tablespoonful of neutralizing cordial, repeating every hour for three hours. I would greatly prefer omitting quinine in all cases, and believe it can generally be done.

When the cold stage comes on, cover the patient well, put hot things around him, and let him rest. During the hot stage, give any sweating drink—as camomile and ginger, alternated with hot lemonade—at short intervals, to hasten the sweat. When sweating starts, withhold medicine and allow rest; but make the most active use of the intermission so as to break up the paroxysms as soon as possible. If there are signs of congestive chill, five or eight grains of quinine and two grains of cayenne should be given every hour till relieved; with the tea of Composition and a little scullcap in it every fifteen or twenty minutes. Hearty eaters with a foul tongue may need a stimulating emetic during the first intermission so soon as the sweating stage is off. Sensitive and burning stomachs can not take cayenne, but should have it applied outwardly over stomach, as by the Stimulating Liniment, during the

intermission. Cold feet should be bathed in hot water with salt and a little cayenne.

After breaking the paroxysms, continue the tonic as for intermissions four times a day; and maintain daily action of the bowels. It is liable to return every seventh day for at least four weeks; and this should be prevented by using the Tonic every three hours beginning on the sixth day, and resorting to the quinine or other anti-periodic on the seventh day. Thus, one whose last paroxysm was on Friday, should anticipate and take measures to prevent its recurrence on the Thursday, Wednesday, Tuesday, and Monday, respectively, of the four succeeding weeks.

Diet in this malady should be easily digested, but thoroughly nutritious. Gormandizing or free indulgence in fruits will greatly prolong it; but a scanty or innutritious diet will reduce the patient, and hasten complications or help break down the constitution. A weakened constitution really has no hope except in removal to a non-malarial climate, generous diet, a steady course of mild tonics, freedom from labor and from mental anxiety. A fine tonic for such conditions, or during convalescence, is a pill or capsule containing two grains carbonate of iron, half a grain hydrastin, and half a grain of salicin; one or two pills after each meal.

CHAPTER XXIII.

REMITTENT FEVER. BILIOUS FEVER.

THIS, another form of malarial trouble, is also called Bilious Fever, Marsh Fever, Swamp Fever, African Fever, etc. It is by far the most severe and dangerous of the class, always debilitating, strongly inclined to reduce the system and bring in typhoid conditions, in many localities liable to assume a malignant form.

Symptoms.—Usually there is a short period of languor, headache, nausea, and furred tongue, before the onset of the disease. Then comes the cold stage, which is so light as to be little more than a sense of moderate chilliness creeping here and there over the surface, lasting half an hour or more, occasionally reaching a mild chill. After this the fever rises quickly. Flushed and burning face, intense throbbing headache, exceedingly hot skin, hurried breathing, violent pains in the back and limbs, nausea and probably

distressing vomiting, great thirst, foul and yellow tongue, scanty urine, with rapid and pretty strong pulse, continue from eight to twelve or sixteen hours. A feeling of relief then follows, with slight moisture, less restlessness, probably a quiet sleep, and some abatement of the pulse. But the fever and pains do not wholly subside, though there is a more or less distinct remission for a time; and then, just twenty-four hours from the first onset, there is another and prompt return of all the previous symptoms. Such regular daily returns mark the periodical and malarial nature of the attack, though the onset by chill and the period of distinct intermission be wanting. Constipation is usually obstinate.

Any one or more of the symptoms named may be gravely exaggerated in severe cases, or lightened in mild ones. Headache may pass into delirium, vomiting may be violent and eject blood, stools when obtained are generally bilious but may be slate-colored or contain blood, the period of relief may occur irregularly and be much shortened, the fever and restlessness may show only trifling abatement. Such facts would be of bad omen; while increasing and prolonged remission may accompany an improvement of all these symptoms, and bring the patient on the way to health by making the case one of distinct intermittent fever about the seventh day. Other cases break up from the twelfth to the fourteenth day.

Any time after the fifth day, but oftener after the second week, a case progressing unfavorably may give signs of increasing prostration and pass into the typhoid state. This is marked by a smaller and more rapid pulse, dusky flush on the face, tongue getting brown or black and cracking over its dry surface, usually delirium, possibly diarrhoea, and great loss of muscular strength. Bleeding from the bowels, lungs, or stomach, greatly increases the danger. Apart from typhoid, there is liability to inflammation of various organs during the malady, as of the stomach, liver, spleen, bowels, lungs, or brain. Such complications aggravate the sufferings and add to the dangers. They may subside with the malaria, or remain after it has been overcome. Convalescence is always slow, presenting the fact of great debility. A yellow tinge is common throughout, and may remain some time after; and an enlarged and hardened liver is common.

Treatment.—Secure two evacuations from the liver each day by the leptandrin pills, unloading them the first day with an enema of a pint of tepid water and a fourth of a teaspoonful of powdered ginger. Or one may start with a small dose of anti-bilious physic,

and four hours after take a seidlitz powder. While the fever is on, sponge the face, temples and hands quite frequently but gently with lukewarm water. If the heat is great and much prolonged, the entire surface may be sponged once, and a little soda added to the water. Allow small quantities of lemonade or cream-of-tartar water every little while, and small bits of ice to be let dissolve in the mouth. Every three or two hours give two grains cypripedin and one grain scutellarin; or make a strong infusion of three parts lady slipper, one part camomile, and half a part scullcap, and give one to three tablespoonfuls, warm, every hour. If the stomach is too irritable to accept much medicine, give a very weak and tepid infusion of spearmint or balm in small quantities; a teaspoonful or less of Neutralizing Cordial every two hours; an enema of a heaping teaspoonful lady slipper and one-fourth that of scullcap in two or three ounces of thin starch water every three hours, to be retained; and apply Nervine Liniment over the stomach, and then cloths wrung out of hot water, or a light poultice of flaxseed containing half to a whole ounce essence of origanum. Sometimes, with an exceedingly foul tongue, it will be necessary to give a prompt emetic at the start; but otherwise avoid the emetic, and do not repeat it. Weak boneset infusion is valuable in this stage, though very bitter.

When the bowels have been suitably moved and the above course continued till the rapid pulse and general signs of fever begin to abate somewhat—showing the paroxysm has about run its course—anti-periodics are to be used. Of these quinine is the strongest; cinchonidia of about half the strength of quinine, but less exciting to the brain. One grain of quinine in a capsule, or the bisulphate dissolved, may be given every hour till the fever is near its time of return; or two grains of cinchonidia every hour. Neither of these preparations should ever be given till the bowels have been fully evacuated, and their continued use is allowable only while the liver is maintained in free daily action. This being secured by the time the second paroxysm is passing off, two grains of quinine or four of cinchonidia may be given every hour and a half during the following period of remission. No such anti-periodic should be given nearer than one hour to the time when the fever is again expected to rise, nor be commenced until the fever has begun to abate perceptibly. If the period of remission is longer than ten hours, the time between the doses of anti-periodic should be lengthened to two hours or more. Light doses between

the fall of one paroxysm and the rise of another, are the fullest allowance, and less, as the remissions lengthen. Continue during the fever the measures first named.

Quinine may be unbearable to the stomach or to the brain. Other anti-periodics may then be used effectually. Of these I mention: Fluid extract of gentian, half a drachm or drachm in a small teaspoonful of neutralizing cordial. Powders of scutellarin two grains, hydrastin one grain, myrrh half a grain,—these quantities as one dose, though very sensitive stomachs will compel a great diminution of this dose. When the patient is much depressed, add one to two grains of cayenne to each dose of anti-periodic used.

During the remissions allow moderate quantities of light but nourishing diet. When convalescence begins by a complete intermission between the paroxysms, treat it as already directed for ague; but recovery is quite slow, and relapses must be guarded against very carefully.

CHAPTER XXIV.

YELLOW FEVER.

THIS alarming disease is limited to cities on the sea coasts and tributary waters in southern latitudes. It has visited the Mediterranean; is oftenest found along the Atlantic coast from Norfolk southward, the Gulf of Mexico, upward along the Mississippi to Cairo, on the western coast of Africa, and through the West Indies; but is unknown in the East Indies, the eastern shores of Africa, and the Pacific coasts. It requires a continued heat of 80° F. for several weeks, to develop it; and this along water courses, for it never extends to inland places. Its origin is supposed to be the decay of vegetable matter of some particular character, aided by animal filth in cities; it being confined to cities and to ships where human exhalations may promote it. Foul drinking water greatly favors it. It is not at all contagious, though generally believed to be so; yet a *foul* vessel may convey its germs and propagate it in a city where conditions are already present that favor it. In this way it has occasionally reached as far northward as Philadelphia, Boston, and Louisville. Sharp frosts at once arrest it; and one attack usually gives immunity for a life-time.

Symptoms.—In apparent health, it starts suddenly with intense headache, chilliness, pains in back and limbs, glistening and suffused eyes, dull flush, sudden fever, great thirst, distress at the stomach, soon followed by nausea and vomiting. The chills may vary from trifling to severe; some have giddiness, others stupor, others convulsions, others delirium; some go about for a couple of days with a flushed face and fiery eyes, otherwise feeling well, suddenly fall into depression and die. Bowels either costive or giving offensive discharges; tongue furred heavily, yellow.

In from one to three days, a strong yellow tinge spreads over the skin, changing to bronze. Fever lowers, the symptoms are relieved except tenderness at the stomach, the patient feels himself getting well. From this point he may recover quickly; or vomiting of blood may set in (black vomit, coffee-ground vomit), and bleeding occur from the bowels and elsewhere. Great depression accompanies this vomiting, with variable and feeble pulse, brown tongue, and muttering delirium. If recovered from, the convalescence is slow; if death ensues, it is usually from the fourth to the sixth day of the attack.

Treatment.—Quick promotion of a *moderate* sweat in the fever stage, is of chief importance. To this end, cover the patient *moderately* in bed, put jugs of hot water along the sides and limbs, sponge the face and hands frequently with tepid water, and give as much warm infusion of the Sweating Powder as the stomach will receive every twenty or thirty minutes. Sage tea, or other diaphoretic may be used. Allay irritation of the stomach by small bits of ice held in the mouth to dissolve, and by Stimulating Liniment over the stomach followed by a spice-bag wet in warm water. Sometimes a teaspoonful of the solution of soda hyposulphite once an hour, is of service. An injection of from four to eight ounces of very thin starch water, lukewarm, containing one or two teaspoonsfuls of powdered white root, may be given every two hours or oftener; and is valuable in promoting a sweat, allaying thirst and maintaining kidney action.

When sweating begins, carefully avoid making it excessive. Withdraw the hot jugs, give but little infusion. Keep the patient strictly in bed without regarding his assertions that he is well, cover him snugly but not heavily, allow animal broths and warm gruels but no solid foods. A fair dose of anti-bilious physic, or a seidlitz powder is needed at the start, but avoid cathartics after the second day. A very prompt emetic the first day is advisable

often. If depression and hemorrhages occur, use Stimulating Liniment over the stomach and along the entire spine, and every two hours give an injection of two ounces of starch water with half to a whole teaspoonful of composition powder and nearly as much scullcap. By the stomach give only the soda solution for vomiting. Continue in bed snugly covered, and with the greatest possible quietude. Nurse convalescence with only the very mild tonic, an exceedingly light diet, keeping the bed for many days and giving the best of nursing for two or three weeks.

Prevention.—Nothing in the history of yellow fever justifies fear of its being communicated from person to person, and it is questionable whether it can ever be conveyed in clothing or merchandise. Hence quarantine should not detain well persons from a vessel or a port where it is. But vessels during hot weather may retain for some time and carry to distances the power of developing it; and need thorough cleansing, airing and disinfecting—especially by dry heat or by superheated steam. In cities liable to it, a rigid course of preventive sanitation has secured immunity; and an epidemic has been brought to an end by the citizens removing inland from the limited part of the city that has been found a center for it.

CHAPTER XXV.

DENGUE. BREAK-BONE FEVER.

SOMETIMES called Dandy Fever. An infectious fever with an eruption, peculiar to southern sections and unknown in the North. At times it is epidemic, and spreads over a wide area and attacks great numbers. In Charleston the epidemic of 1850 produced 10,000 cases, but none proved fatal. It is known in Central Africa, India, Persia, Burmah, and similar localities.

Symptoms.—With little or no premonition the attack develops very suddenly, beginning with severe pain in some joint (probably of a finger), extending in a short time to other joints and along the bones, and during the attack shifting here and there among the joints in a manner quite like rheumatism. This pain is severe and torturing, without inflammation in the joints but often with swelling, and racking the patient as if his very bones were being

broken. At the same time there is severe pain in the head, eyeballs, neck and back. Fever starts at once, with puffiness and redness of the face, sore throat, congested eye-lids, and prostration. On the third day a rash appears, resembling scarlatina and extending over the whole body in most cases. Now the pulse becomes rapid (110 to 125 or more per minute), the skin very hot and the breathing hurried. In one or two days this rash disappears, the fever abates suddenly (unlike scarlet fever), and the patient is free from it for two or three days. Suddenly the fever rises again, and a second rash appears, now resembling measles or nettle rash, perhaps first noticed on the palms of the hands. This second rash may be light or very abundant, and usually leaves the cuticle peeling off. The second rise of fever passes off gradually; the patient is prostrated and for many days is still tortured with pains and swelling in the joints, chiefly the smaller joints; and convalescence is tediously protracted through several weeks, during which time there may be one, two or several relapses both of fever and suffering.

Dengue is very seldom fatal; but it always leaves the patient exceedingly feeble, and in severe cases this may not be overcome for months—the whole constitution seeming to be shattered. In rare instances it has a malignant form, the body heat being excessive, the patient becoming drowsy or even comatose, the heart failing and the surface looking blue. From this latter circumstance, which occurs about the seventh to ninth day, it is by the people called the “black fever”; and is a highly dangerous malady. Some cases are so mild that the fever and rash are trifling, and the suffering causes it to be thought a case of rheumatism, but the general weakness proclaims its true nature. Some persons suffer it more than once. It attacks all ages; and, while its origin is unknown except as to its being from a specific poison developed in warm latitudes, it seems to be capable of conveyance from one person to another to a limited degree.

Treatment.—A sustaining course of management is the proper one. Bathe the joints eight or ten times a day with a tepid infusion of black cohosh and lady slipper, or these in strong tincture. On such days as the skin is very hot, sponge the surface two to four times a day with lukewarm water containing a little cooking soda; and use the Sweating Powder. For the general suffering, one-fourth part lady slipper may be added to this infusion; and three grains dioscorein and two grains scutellarin (or an equivalent

infusion of the herbs, made strong) given every three hours. Keep a gentle action on the liver by two grains euonymin every twenty-four or twelve hours, but carefully avoid active purging. When the fever subsides, sustain the patient well with the Nervine Tonic or Compound Gentian Syrup; apply the Nervine Liniment two or three times a day on the joints and other painful parts; and use moderate infusion of Composition rather liberally. A daily sponging with tepid water and a trifle of soap, followed by the application of camphorated oil, will abate the skin irritation. A quite nourishing diet, in moderation, is proper.

CHAPTER XXVI.

ERYSIPelas.

"*St. ANTHONY'S FIRE*," and "*Rose*," are names given to this malady, because of the peculiar burning sensation it causes, and the bright rose color it usually gives to the affected part of the skin. It commonly begins suddenly, after exposure to high heat about the face and head (as in cooking) and then a sudden change to a cold place or draught. A disordered state of the stomach usually precedes an attack, the use of sweets favors it in some persons, and some families are subject to it. It is not contagious, though discharges from it are liable to develop it when they find their way into cuts or abrasions. Its favorite site is the face, spreading thence toward the head; but it may appear on the extremities at the same time, and spread toward the trunk. Once suffered, it is prone to appear on the same parts on moderate provocation; and may return at uncertain intervals for many years, though not necessarily so. Simple cases are not dangerous; but severe cases are often very dangerous, and may involve the brain or lungs fatally, or rapidly cause deep abscesses or gangrene in parts, or remain for years on a limb as large superficial ulcers of a deep maroon color and quite exhausting. If it follow an injury or an operation or confinement, it is likely to prove troublesome or very serious.

Symptoms.—In the simple variety, it starts with a stinging sensation at some point, soon followed by a bright rose-red color, heat, some swelling, and tightness of the skin. Chilliness is com-

mon, after a time followed by fever; but fever may set in at once without chilliness. It is not a very high fever. The eruption spreads steadily across the face or forehead, and the skin is tense and shining, has a burning sensation, and is hot and swollen. The eyelids puff up greatly; the head aches, the tongue is white-furred, the bowels are constipated. Light cases improve in a few days; bad cases may develop delirium, form blisters under the skin at various points, and cause great prostration.

In phlegmonous erysipelas, the color of the eruption is dusky, or deep maroon, or even purple. Prostration is great from the onset, chilliness strong and very prolonged, fever comes on slowly and is not strong, restlessness is very great, delirium is common and perhaps very severe. It is this variety that inclines to form abscesses in a few days; or to suppurate among the muscles and let the pus float to a distance, giving a soft and doughy feeling to the parts, and profoundly exhausting the patient.

Treatment.—In the simple cases, moisten the parts every hour or oftener with a rather strong infusion of lobelia, adding a tablespoonful of glycerine to each half pint of the infusion. Cover them with a thin piece of old linen wet in this wash, patted down closely upon the skin, and over this place a thin layer of picked-out cotton-bathing. Give a tablespoonful of Neutralizing Cordial every two hours till the bowels move, and then a teaspoonful or more every three hours. For the fever, use an infusion of balm, or weak sage, or white root, moderately.

Severe cases, with dusky eruption, need a wash of two parts lobelia and one of golden seal, adding glycerine as before, and keeping the parts constantly wet and covered. Move the liver at once with a full dose of leptandrin, or the compound leptandrin pills, and give a small dose of leptandrin and golden seal every twenty-four hours. A teaspoonful of Neutralizing Cordial every four hours, and in this four grains of scullcap. An infusion of two parts each white root and ginger, one part each lady slipper and blue cohosh, should be made rather strong, and three or four tablespoonfuls given warm every hour or hour and a half. If the patient is chilly, composition tea should be given freely and hot every half hour till relieved. In bad cases of this class, nothing equals strong composition tea with one-eighth part blue cohosh, given abundantly once an hour; and a powder of two grains or more each of golden seal and scullcap, every three hours, in a teaspoonful of Neutralizing Cordial. A thoroughly stimulating

emetic early in such cases, is invaluable. If pus form anywhere, it must be let out very early; and the parts washed and kept covered with a cloth, wet with a strong infusion of golden seal and glycerine, adding a tablespoonful of compound myrrh tincture to every gill of this. For great restlessness and wakefulness, a small injection may be given, every four or three hours, of a teaspoonful of powdered lady slipper and half as much blue cohosh in thin starch water.

The diet of simple cases should be plain and light, avoiding all acids and meats. In the severe and phlegmonous cases, support the system well with milk, beef tea, broths, eggs, etc.; and during convalescence use tonics.

CHAPTER XXVII.

GLANDERS. FARCY.

HORSES, mules and donkeys are the animals with which glanders originates; and from them it is communicable to other animals, and to man. Fortunately it is very rare in man,—only nineteen deaths from it having occurred in England out of more than two million recorded deaths from all diseases in three years. It is exceedingly fatal, 208 having died out of 245 cases.

Symptoms.—In from three to eight days after exposure, the patient begins to suffer chillness, headache, pains in the joints and muscles, general sense of fatigue and prostration, and fever. With the fever come on furred tongue, restlessness, high-colored urine; chilliness recurs from time to time; and presently there are profuse and sour perspiration, thin and foetid diarrhoea, excessive thirst, irregularity in the fever, difficult breathing, and finally delirium, coma, and death. An acute case generally lasts three weeks; but many terminate within ten days, while some linger six or eight weeks.

While this general course of symptoms is in progress, many and various local symptoms appear. Most constant of these are swelling and inflammation of the nose, with thin and offensive discharges that become thick and pus-like, and terminate in ulcerous destructions in the soft tissues and bones of the nose. These nasal troubles are quite characteristic, generally appearing early but

occasionally being delayed. If the animal virus has been received upon a wound or abrasion of the skin, the part swells, becomes hot and painful, passes into a foul and offensive ulcer, and the glands in its neighborhood swell and the parts adjacent get puffy. Glandular swellings are then probable over most or all of the body, becoming small and foul abscesses. A peculiar eruption also appears over the skin, at first as small red stinging points somewhat like the poison-ivy infection; then running together and extending, rising above the surface, and suppurating. These spots may be livid and filled with thin pus and blood, presently breaking down and leaving foul ulcerous holes that look as if they had been punched out. This eruption may begin in two or three days from the onset of the attack, the puffy and ulcerous places coming in a week or so and continuing to the end of the case. When they appear, the general strength begins gradually to fail and the fever symptoms to be of the low type; other mucous tissues besides the nose are pretty sure to suffer, such as ulceration of the bronchi with severe cough and heavy rattlings in breathing; ulcerations in the mouth, throat, eyes, and stomach, with hoarse and painful speech, puffiness and pallor of the face, possibly perforation of the stomach by ulceration; many other evidences of general poisoning with direct tendencies to foul ulceration and gangrene.

Treatment.—Support the system as vigorously as possible, using a strong infusion of Composition in abundance and at short intervals. Peruvian bark may be used in equal quantities with the Composition; or every two hours give two to five grains quinine with two grains myrrh and one grain cayenne. If diarrhoea appear, add one drachm Compound Tincture Myrrh to two ounces Compound Syrup of Bayberry and give a large dose every two hours. Cauterize the poisoned wound freely with a red-hot iron, if its character is detected early. Open all abscesses and collections of matter quickly and freely; then wash them out well and often with strong borax water (one ounce to the pint), adding two or more ounces Compound Tincture Myrrh to each pint. Follow each washing of the parts with poultices of flaxseed and charcoal in equal parts, using the borax and myrrh water in wetting the poultice. Wash the mouth and nostrils with the same water, which is one of the most valuable antiseptics. Ten to twenty grains of thymol to each pint of this wash, will be advisable for mouth and nasal use if the nostrils are not too sensitive; and on

this account the simple tincture of myrrh may have to be used in the borax water instead of the compound myrrh tincture.

If the entire system can be filled, so to speak, with Composition, Peruvian bark, and myrrh, there may be some hope of saving the patient. The utmost energy must be exercised in employing both outward and inward medication. And those in attendance must take the utmost precautions against infection, for this very dangerous malady is easily communicable through scratches on the skin, etc.

CHAPTER XXVIII.

MUMPS. PAROTITIS.

YOUNG people, sometimes adults, may be troubled with inflammation and swelling of the parotid glands at the joint of the jaws, and sometimes the salivary glands under the angles of the jaws. It is contagious, going through large neighborhoods. One side only may be affected, or both at once, or one after the other.

A week after exposure, the trouble begins. There are pain under the ears and about the jaws, stiffness in these parts, and a stiff, sore feeling through them on swallowing, swelling, tenderness, and moderate fever. Sometimes these symptoms are preceded by several days of bad feelings, and poor appetite with restless nights; again the malady may start in with some chilliness and perhaps vomiting; but may come on suddenly with the first named symptoms. The fever lasts but a few days, the increasing swelling and tenderness being the principal troubles. It is painful to open the mouth, yawn, talk, or masticate; saliva may be profuse or diminished, the skin over the parts changes color but little. Vinegar or other acid taken into the mouth causes pain. In from six to eight days these symptoms begin to abate, and are gone in a few more days, perhaps leaving the glands hard for a time.

Mumps are in no sense dangerous, and liable to form abscesses. But from exposure or carelessness they may "translate" to the testicles of males, causing swelling, tenderness, and severe inflammation; or to the breasts or ovaries of females, causing inflammation in these. Young persons are most liable to these translations; and they may occur at any stage of the disease. In

rare instances, the malady has passed to the brain, suddenly causing stupor and meningitis.

Treatment.—House the patient strictly in a warm room for eight or ten days, generally keep him in bed the first three days, and move the bowels gently the first day or two with any mild physic. Protect the parts with a light handkerchief tied over them; and in very painful cases apply camphorated liniment every four hours, or wash with a strong infusion of lady slipper or of mullein. If translation threatens, use warm baths every twelve hours, apply a flaxseed and lobelia poultice to the swollen parts, and give frequently of some sweating tea. Weakly and unhealthy patients may remain debilitated after the mumps, and will require a gentle tonic for some time,—as the Nervine Tonic.

CHAPTER XXIX.

ULCERS OF THE MOUTH.

SEVERAL forms of ulcer, with inflammation, occur in the mouth,—upon the tongue, lips and cheeks.

I. *Mercurial poisoning (salivation)* is now a very infrequent affliction; though in the not very remote days of medical barbarism, when the use of calomel or some other form of mercury was thought to be a necessity in every case, this miserable inflammation was a very common occurrence. To “touch the gums” with mercury was daily practice; and the poor sufferers long submitted to it, and to its associate loss of teeth and subsequent wreckage of constitution, with perfect docility. It was a practice that came from the ignorance of the dark ages and the wild speculations of a drunken medical charlatan; yet so fastened itself on the profession for several centuries, that the physician who did not resort to mercury almost continuously and for everything, was set down as a quack. But finally a few brave and honest men led a warfare upon the wretched destroyer of muscle, bone and blood; and succeeded at last, through much contumely, in arousing such popular indignation against it that the physicians were forced to abandon its use simply because the people would not submit to it any longer.

At this time there is a considerable revival of the use of mer-

curials by physicians. Most of it is done surreptitiously, the patient having no thought that he is taking calomel or blue mass ; and so unfamiliar are the people now-a-days with the signs of this poisoning, that they suffer its slow ravages many times without knowing the cause. More commonly, however, corrosive sublimate is the form of mercury used ; and this in the way of various soaps, washes, lotions, etc., as means of destroying the bacteriæ, bacilli, the vibriones and other microscopic beings that are supposed to cause so many diseases. It is given internally for the same purpose in typhoid, consumption, and a great many other maladies,—the people little suspecting the dangerous poison that is prescribed for them, but admiring the microscopic learning of the doctor while suffering from the ravages of his mercurials, which they imagine to be the work of bacteria. This whole wretched theory is the wildest and most damaging speculation that has afflicted so-called "modern medical science"; and I feel it my duty in this brief paragraph to warn the people of its dangers. While the doctors who believe in such trashy speculations are destroying the bacteriæ and bacilli—of which it takes 120,000, head to tail, to make one inch,—while, I say, they are destroying these with their sublimate soaps, washes, injections, fumes, drops, pills and mixtures, they are at the same time poisoning and destroying their patients. Of late years I have met numerous cases of salivation and serious mercurial destructions, brought about by these prescriptions.

Salivation causes the tongue to swell, become soft, turn dull red, and feel extremely sore ; it is covered with a whitish and tenacious exudation, which is presently mingled with blood that oozes from small fissures upon its smooth surface. The salivary glands are tender and swollen, and pour out great quantities of saliva ; and the glands under the jaws and about the throat also get poisoned and inflamed. If the case become more severe, the swollen tongue fills the mouth and is forced out between the teeth ; the saliva drools away helplessly, and dries into an offensive crust upon the tongue's protruded surface ; talking and eating become impossible ; the sides of the tongue pressing against the teeth become painfully ulcerated ; the swollen glands cause the blood to accumulate in the face, which becomes blue and swollen ; and breathing is distressing. At the same time the patient is feverish and restless, and is altogether a pitiable object. These distresses usually occupy from five to ten days, and then abate suddenly ;

but many are followed by a decided chronic poisoning, which leaves pain and soreness for years, with tender and spongy gums and decaying teeth as inevitable results. Prof. N. Chapman, of Philadelphia, himself a believer in mercury, was accustomed to say, "Any fool can salivate a man". When we recall the pride that physicians used to boast in giving mercurials, one is reminded of Solomon's saying, "It is as sport to a fool to do mischief".

In *treatment*, it is of advantage to suck small pieces of ice almost constantly, and to wash the mouth with a teaspoonful of borax in a pint of water. Enemas should be used to move the bowels. It is usually necessary to make some incisions lengthwise of the tongue, to let the blood and serum under the surface escape; and swollen and spongy gums require to be lanced with the same object. After the more acute suffering and swelling have subsided, the management may be the same as for *aphthous* sores.

II. *Aphthous ulcers* are most common in nursing children; but may occur at any period of life, and sometimes become an afflictive symptom in the latter stages of consumption. They generally begin with small spots of inflammation, which are red, swollen, hard and tender, the flow of saliva at the same time increasing. In a short time these elevated points become grayish or grayish-white blisters, with a pale and hard ring around them. The patient is somewhat feverish and restless, the glands under the jaw frequently swell and become tender, and there is some difficulty in eating and swallowing. Presently the little gray blisters burst, leaving whitish-yellow ulcers with a raised and red edge; and these ulcers often run together in patches. Now the entire mouth is likely to be inflamed and tender; one crop of blisters and ulcers may follow another till much of the mouth and throat is occupied by them; digestion becomes severely disturbed; and there is danger that to this condition there may follow an offensive diarrhoea that is always prostrating and to young children is quite serious. The discharges from such ulcers are clearly poisonous to the stomach and bowels. It is this form of sore mouth that sometimes attacks nursing women, and proves very weakening and obstinate.

Treatment in this class of ulcers should always be prompt and vigorous, for they are by no means as easily cured as some of the other ulcers. Cleansing of the mouth with cooling and antiseptic washes is of the greatest importance. For this purpose, a moderately strong infusion of sage, raspberry leaves, witchhazle leaves, or wild cherry bark may be used, adding an even teaspoonful or

less of borax to a half pint of the lukewarm infusion. Sometimes a teaspoonful or two of glycerine is an advantage in such a wash. If the ulcers seem disposed to spread and the discharge is sticky and offensive, a proper wash can be made of a moderately strong infusion of golden seal, adding to four ounces of it a tablespoonful of glycerine and a teaspoonful of myrrh tincture. After washing the mouth out well with the first wash, this preparation may be applied freely to the ulcers with a feather or brush every few hours; and some of it may be swallowed. Digestion is to be sustained by tonics; and diarrhoea must be checked promptly by Neutralizing Cordial with an equal part of the syrup of cherry. In obstinate cases, it will be necessary to wash the mouth with the soda hyposulphite solution and to give one or two teaspoonfuls of the same four times a day.

III. *Thrush or Sprue* is a form of ulcer similar to the above, but not so severe. It usually begins with a few days of restlessness, slight fever, a little diarrhoea, and possibly vomiting,—disturbances that should always attract attention in a nursing child, and lead to prompt attention to the mouth. Then white spots, looking like bits of curdled milk, appear upon reddened patches of membrane in the mouth, over many places on the cheeks, tongue, etc. At first these spots are easily removed, but soon this cannot be done. The mouth is hot and dry, afterward the saliva becomes abundant, the abdomen is painful, and there are green and acrid stools that excoriate the anus and thighs. Little babies will soon become drowsy and stupid, refuse the breast, and may soon die. In treatment, the same course is to be followed as in the preceding class, and it must be very prompt and thorough.

IV. *Common ulcers* occur under a variety of circumstances, but especially when digestion is not perfect or the stomach becomes acrid. The mouth feels uncomfortable and hot, dry, with considerable patches of red through it. In a day or two there begins a flow of glairy mucus, with some swelling and tenderness of the tongue and cheeks, a foul or even bitter taste; and then round white spots, elevated, scattered, that peel up from the edges and leave slight excoriations. A wash of golden seal or poplar bark with a little borax is sufficient; at the same time correcting the stomach with Neutralizing Cordial, moving the bowels with powdered magnesia, and regulating the diet to plain articles in moderation.

CHAPTER XXX.

A FIT OF INDIGESTION.

UNDER this term may be classed a number of cases that arise suddenly, cause intense suffering in the stomach for hours, are not associated with inflammation or fever, and are accompanied by arrest of the digestive processes with crowding of blood upon the stomach and liver. From the latter circumstance, these attacks are sometimes called *Acute Congestion of the Stomach*. In some instances they are neuralgic, and are called *Gastrodynia*, (stomach anguish,—a very apt name). Similar distresses arise in many cases of prolonged dyspepsia, gout, stomach ulcer, and other chronic diseases of this organ: but I here wish to consider those sudden attacks which may not be caused by these more serious maladies.

The attack usually begins from two to four hours after a meal, sometimes much sooner. It causes paroxysms of agony through the stomach, often extending to the back, with short intervals of comparative relief, the paroxysms gradually growing more severe. The patient does not want to lie down, gets pale and cold, may be covered with a cold sweat, frequently suffers with spells of violent retching, and is the picture of extreme misery. In the course of several hours the distress begins to moderate, and slowly ceases,—leaving the patient pale, weak, without appetite or digestion, sensitive at the stomach, constipated and miserable for several days.

Such attacks are usually provoked by some dietary indiscretion, the stomach being previously feeble and the liver sluggish though not attracting any attention. A limited amount of ordinary foods may then fail to be digested, or be partially digested and pass to the duodenum before the distress begins. Iced water, ice cream, or other very cold articles, quickly promote trouble under such circumstances; and mental anxiety, sudden cooling of the surface, fatigue, loss of rest, or similar sources of general disturbance, may aid the attack. Such persons are liable to repetitions of the distress on very slight provocation; and must be very rigid in their dietetic and other habits thereafter, else life will to them become miserable.

Treatment.—Apply over the stomach the Nervine Liniment, or an infusion of red pepper in vinegar and water, and lay on hot

and dry flannels. Repeat every hour or two, as needed. In a teacup of water put nearly an even teaspoonful of cooking soda, ten to fifteen drops spirits of camphor, and half a teaspoonful of dioscorea; and give a small teaspoonful of this every ten or fifteen minutes. If there is flatulence (which is very common), a few drops essence of peppermint may be added to the medicine, or some ginger. Food in moderate quantities may be present in the stomach, and relief can not be obtained till it has been ejected by vomiting. After giving three or four doses of the soda preparation, give a pretty large draught of hot water with salt, and repeat in ten minutes. Vomiting will soon be induced. Sometimes a swallow of pretty hot water after each dose of the soda preparation will give much relief. If the bowels seem full, a large injection of lady slipper with ginger must be given presently and a free evacuation secured,—repeating in an hour or less, if necessary. Bathe the feet in quite warm water, adding a little ginger or mustard, if they are cold. Sometimes a mustard leaf or mustard poultice over the stomach till the skin begins to redden, is by far the best application; and the liniment and hot flannels when this has been removed. So great is the distress in the back with some persons, that similar applications will be needed there.

Persevere actively in these measures till relief has been obtained. Then give an infusion of the Nervine Tonic; or make it into a syrup, adding one part of wahoo to secure gentle action of the liver. Or an infusion of camomile and wahoo is suitable. Only small doses of tonic are needed. Regulate the diet with scrupulous care, so that only the light and easily digestible foods shall be used and all heavy articles be abstained from. Care in this direction may be demanded for weeks, or even for months in persons who have become subject to these attacks. Iced articles and large quantities of fluid must be prohibited strictly, and meats used in great moderation. Such persons are generally of sedentary habits, with the brain probably too much occupied with business, study or anxiety; and these should change their modes of life so as to escape so much taxing thought and obtain more daily muscular exercise.

CHAPTER XXXI.

BILIOUS VOMITING.

VOMITING proceeds from a great variety of causes, as irritants in the stomach, acrid poisons, undigested food, cholera infantum, brain troubles, inflammation of the liver, and others. But very many persons have attacks of vomiting arising more or less suddenly, commonly known as "a bilious attack." Food and mucus are first thrown off; then mucus with green or yellow and very acrid bile. Headache, dizziness on attempting to rise, furred tongue, constipation, sense of great and sudden weakness, and possibly a little feverishness but oftener feelings of chilliness, accompany these vomitings. Even the smell of food is disgusting to the patient, who is very wretched and pale while the attack lasts. It may continue for one, two or three days; and leaves the sufferer feeling weak yet much relieved.

Such attacks are generally provoked by hearty eating and consequent indigestion; by exposure, mental over work, and similar taxations of the body at a time when the stomach and liver are burdened. Some persons are liable to their frequent return, when they resemble a "sick headache;" others have them rarely, and are usually warned of their approach by an intense appetite leading to over indulgence.

Treatment.—Keep very still in a darkened room, and avoid food of any kind. Move the bowels promptly with a large dose of citrate of magnesia, or anti-bilious physic with cream-of-tartar, or powdered magnesia, or infusion of senna with manna. Aid the action of the physic, if necessary, by an injection of salt, ginger and water in four hours after giving the physic; or else repeat the cathartic if the first dose has not operated. When the disturbance has subsided, use the Nervine Tonic in small doses for a few days. Early use of the Leptandrin Pills will generally prevent these attacks.

It is a not uncommon fact in bilious conditions, that alkalis, as soda or magnesia or lime water, are exceedingly objectionable to the stomach and greatly increase the tendency to vomit. On this account it may be best to give these persons Rochelle salts and rhubarb for a physic; and sips of lemonade or vinegar may be found very acceptable.

CHAPTER XXXII.

ACUTE INFLAMMATION OF STOMACH.

VERY rarely is this trouble met with, though it sometimes is associated with inflammation of the upper bowel. It may follow severe outward violence, as blows or kicks; and will be caused by swallowing certain poisons, as lye, caustic potash, oil of vitriol, aqua fortis, etc.

Symptoms.—Intense burning sensations in the stomach, tenderness of a severe degree on slight pressure, frequent and violent vomiting, and great thirst, are the chief symptoms. Suffering is very great, whatever is taken into the stomach is vomited in distress in a few minutes, some feverishness is present but soon the patient is cold and shows signs of sinking, the vomited material becomes green, bloody or brown. It may terminate fatally in a few hours; or pass into stomach softening or gangrene in from one to three days, with clammy sweats, blueness, hiccough, and sudden cessation of pain before death. Under these circumstances it is a highly dangerous malady; but slight cases may be provoked by strong spices, mustard, liquor, and other stimulants, and give a milder class of symptoms with recovery in from four to twenty days. Large draughts of very cold iced-water, when the body is heated, often cause sudden and severe congestion of the stomach, with prostrated symptoms resembling an advanced degree of inflammation. When inflammation of this organ is recovered from, it remains sensitive, feeble, and with very little digesting power for many weeks or months, or even for years.

Treatment.—Nothing will be tolerated by the stomach, therefore nothing should be put into it, unless an acrid poison is present, when it may be removed quickly by an emetic, as directed in the section on poisons. Even cold water, though craved with agony, will be vomited soon, and must be forbidden. A feeling that an emetic will do good must not be obeyed if there is not full evidence of acrid substances being present.

Let the patient lie down, and be persuaded to the utmost possible stillness,—neither tossing about or jumping up. Wet the lips and mouth at short intervals with just a few drops of cold water. Bathe the region of the stomach with a strong wash of red pepper every three hours or oftener, and lay over it a very light and soft flaxseed poultice, moderately warm, and renewed as

needed. Unload the lower bowels by an injection of tepid water or infusion of catnip, but on no account give any physic.

After the first twenty-four or thirty hours, give small injections of barley water every three or four hours as nourishment, but allow no food of any kind to the stomach. When the severer symptoms have abated, give a teaspoonful or two of gum or elm water occasionally. Continue the utmost quietude till the patient has become much easier. Nurse convalescence with a very weak infusion of cherry bark, a teaspoonful or two every three hours; return to the use of food very cautiously, using only the very simplest for a long time,—barley gruel, farina, softened crackers, etc. Suffering and relapse are very easily provoked by indiscretion.

There is a strong temptation to use morphine or other opiates in this distress. But such a course will almost surely cause congestion and increase the hazards of death. Adhere firmly and patiently to the course I have directed.

CHAPTER XXXIII.

CHRONIC INFLAMMATION OF STOMACH.

INDIGESTION occurs under almost a multitude of forms, a great many troubles proceeding from or finally including the stomach. One of these forms is due to chronic inflammation of this organ, the degree of inflammation being slight, but the irritative sensibility being considerable and constant. It sometimes follows acute inflammation; but more frequently it is developed gradually by errors of diet, such as the too free use of spices and condiments by which the stomach is goaded and stimulated, by "rich" living in general, the habitual use of wines, and other exciting habits. Generally it is found in persons of the nervous temperament.

Symptoms.—Unlike dyspepsia and the simple forms of indigestion, a constant sense of tenderness and burning in the stomach is suffered. This burning is limited in its area, but continues almost without abatement and without regard to whether digestion is or is not in progress. A dull aching is also usual, often extending into the chest. Appetite is greatly impaired, and at times almost lost, —the smell and sight of food not unfrequently provoking sickness

and nausea. Thirst is nearly constant, yet its indulgence is very liable to cause distress and vomiting except the amount of fluid taken is exceedingly small. Slight feverishness, burning sensations in the palms of the hands and soles of the feet, slight hectic flush upon the cheeks, and a hot and disagreeable breath, are present. Nutrition fails, the patient gets nervous and melancholy, and emaciation progresses till he is almost a skeleton. Such cases occupy several years, sometimes improving much and then suddenly getting worse, all food at last being rejected by vomiting and the sufferer dying by slow starvation.

Treatment.—As this trouble is so commonly brought about by errors in diet, these must be sought out and rigidly corrected. All spicy and heating articles must be withheld, and this not merely for a time but always after. Liquors of all kinds and grades are to be forbidden. Nothing but the blandest foods are allowable, and these only in limited quantities and at stated times—generally every three hours. Milk is to be the chief dependence for nourishment; and to this may be added the crumb of stale bread, and some persons can at times use cerealine, barley, and a soft-cooked egg. If at any time these latter articles are found to disagree with the stomach, they must be withheld. The quantity used must be such as the stomach is found capable of using with greatest comfort, which is often exceedingly small; but this little would better be given every two hours, or even every hour, than that a larger amount should be given at longer intervals and thus provoke distress and vomiting. Cases occur where but three or four tablespoonfuls of milk can be tolerated as a meal. Dr. Wm. Hunter reported a case where a boy could retain nothing on his stomach, but vomited whenever he ate, being reduced to the last degree in flesh and strength. The doctor directed him to be fed a single teaspoonful of milk every fifteen minutes; when he was found able to retain this without nausea, give a dessertspoonful; when he gained on this, cautiously to increase the quantity and extend the time; finally to bring in limited portions of gruel, panada, milk boiled with a little flour or rice, and at last broths without any fat. Morning and evening he was to be rubbed gently with oil and the hand over the stomach, before a fire. The boy never vomited after starting on this plan, recovered a good tone to the stomach, and gradually became a healthy and strong young man.

In cases of this and other classes, where the stomach cannot

receive sufficient nourishment, the skin may be made use of to absorb a considerable amount of fatty aliment. For this purpose one to four tablespoonfuls of pure cotton-seed oil, olive oil, or cream may be gently rubbed in over the abdomen once or twice a day. It is a good plan to change the fatty substance used from time to time, always being careful to use only what is fresh and sweet. Lard or goose grease may be employed, under necessity; and a pure article of refined cocoanut oil is especially excellent. In like manner nourishment may be given by the bowel to a considerable extent. For such purposes of *rectal alimentation*, barley water, farina, the white of raw egg well beaten with water, and beef or mutton tea may be used,—the amount of an enema being from two to three ounces for an adult, repeated every three or four hours.

Medicine is of quite secondary consequence in these cases, and but very little of it is needed. By using some mild stimulation over the abdomen twice a day, between the times of using the oil, absorption by the intestines will be favored. For this purpose an infusion of smart weed and camomile, or allspice and ginger, will be suitable. Patients are apt to feel that a good emetic or cathartic will relieve them of "biliaryness," but such medicines are totally inadmissible. If costiveness occur, a pretty full enema of flaxseed tea will probably relieve it; and if sallowness exist with constipation, it may be improved by putting over the liver for a few hours a plaster of softened extract of wahoo twice a week.

CHAPTER XXXIV.

CHRONIC CATARRHAL INDIGESTION.

UNDER this title physicians place that form of indigestion which is really most common in the family of indigestions, and the most troublesome. It receives the term "catarrhal," because one of its most constant and leading characters is the presence in the stomach of considerable quantities of tenacious mucus. While most people speak of all these stomach troubles by the general term of "dyspepsia," it is a good plan to use that word for another form of indigestion, as I have done in another chapter. The form I am here speaking of is generally quite slow in its de-

velopment, extending over many months or through long years. It gradually causes the walls of the stomach to swell and soften, or to thicken and harden ; and keeps the surface of that organ so much covered with a dense layer of tough mucus as to prevent the feeble quality of gastric juice from reaching or properly acting upon the food. Gastric juice is a vital fluid, and by its presence with the food prevents it from undergoing any chemical changes while it is being digested. But in this indigestion the juice so fails in this preservative power as to leave the food to ferment rapidly in the warm and moist stomach. In very many cases it is connected with, or actually proceeds from, chronic troubles of the liver and gall-ducts ; and then these must be remedied before this indigestion can be mended. Ulcer of the stomach, and also cancer of this organ, will be preceded and accompanied by catarrhal indigestion.

Symptoms.—These are subject to many differences, because the degrees of change in the stomach, and the variations in the amount and quality of the gastric juice, are very different. Yet a series of symptoms are quite uniformly present, and the variations which are added to these are less constant and of less importance.

Disturbance of digestion is prominent and constant. Appetite is very poor, almost lost, or so perverted as to seek strange and undesirable articles of food ; some crave highly seasoned foods ; some have a strong aversion for any food whatever. With some there is a nearly continuous “gnawing” pain in the stomach and a faintish sensation, which are temporarily relieved by eating. Taste is perverted, thirst is small. Soon after eating a somewhat uncomfortable feeling arises at the pit of the stomach,—rarely amounting to suffering, but giving an oppressive sense of weight, fullness and pressure. The food ferments, distending the stomach much of the time with gases. A desire to gain relief by sighing, dull feelings in the head, and depression or gloom of mind, are more or less marked.

What digestion is performed goes on slowly, leaving the food in the stomach an unusually long time, portions of it sometimes remaining there a day or more. Such portions must ferment in a few hours, the gastric juice being too feeble to prevent such chemical change. In mild cases, this fermentation begins in one or two hours after eating, the person then being annoyed with flatulence and belchings which continue for several hours. In more advanced cases, portions of the fermented food of a meal remain in the swol-

len folds of the stomach until the next meal ; and these act as a species of yeast upon the food of the new meal, starting it into fermentation in a few minutes.

The flatulent gases of fermentation differ in character. At first and in simple cases, the gases are without taste and smell ; in older cases, they are sour and acrid as foul vinegar ; in some bad cases, and where fatty foods are eaten, the gases become exceedingly offensive. The eructations of such gases are sometimes enormous. *Heartburn*, as it is familiarly termed, is due to acrid gases irritating the throat and the upper orifice of the stomach, giving a hot and scalded feeling to these parts. *Water-brash* consists in spitting up or gently vomiting a thin, acrid or nauseating fluid,—often occurring in the morning before any food has been taken.

Vomiting is an occasional symptom, but by no means common. More frequently some of this class of sufferers are troubled with "spitting up" their food, thus easily and with but little nausea throwing up a portion of their meal and a large quantity of mucus soon after eating. Materials thus spat up are usually sour and disagreeable. When food is not thus ejected, it is common to cast out a great deal of tenacious mucus. Constipation is usually present and often obstinate, at times alternated with diarrhoea for a day or two. Some are much troubled with dizziness, especially in the afternoon and evening, which is generally much relieved by free eructations of the gases from the stomach. Flatulent rumblings in the bowels are troublesome to many. In severe prolonged cases, jaundice may be present ; and sallowness, bitter taste in the mouth and similar signs of biliaryness, will appear in cases where the liver is involved.

Some persons with this malady are scarcely reduced in flesh, even where they lose a large part of their food by spitting or vomiting ; while others lose flesh and become extremely thin, though they may not vomit their food, and in these the skin usually gets dry, rough and troubled with eruptions. Dull headache is very troublesome to many, but is absent with others. • Commonly the tongue is coated and slimy, rather large, and pressing against the teeth ; but it may be quite clean.

Amid all these symptoms, there will be various forms and degrees of nervous disturbance, which are not uniform but are often of the most distressing character. With many, there are violent heart palpitations, irregularities of the pulse, and great dread of heart disease,—though no such disease is present, the heart symp-

toms and distresses being merely sympathetic. Mental depression is exceedingly common, and especially if the liver is at the same time deranged. This depression takes various forms of despondency, anxiety, forebodings of evil about to happen, melancholy, and distinct hypochondria. So strong are these at times, that the patient leads a miserable life of imaginary apprehensions, keeping himself in daily and hourly dread of "borrowed troubles", losing hope and energy. When the liver is congested and the bowels are obstinately constipated, such mental disturbances may so fasten themselves upon a person as to lead to temporary insanity; but this must be understood to be exceptional, and an addition to brain disturbance. Crying, trembling, timidity, and other feelings of the kind, are common; and one suffering from such indigestion, as well as from dyspepsia, is inclined to be notional in many peculiar and annoying ways.

Treatment.—By far the great majority of these troubles are brought on by sharp errors in diet, of which too much haste in eating is perhaps the most common. Daily indulgence in alcoholics, even in such limited amounts as to make the tippler pride himself on being a "temperance man" and merely using a little "for the stomach's sake," will slowly but surely establish this indigestion in its most persistent forms. Such facts must be remembered in treatment, for no "moderate drinker" and no hasty gormand may hope to get rid of this form of indigestion without the most prompt and thorough correction of his bad habits. It is a trouble always difficult to remove, requiring months and years of circumspection, and prone to return unexpectedly when one flatters himself on being so fully restored to health as to admit renewed indulgence. It is not often dangerous in itself, but is always very troublesome. It sometimes arises in the course of anæmia, and chlorosis, and then these conditions will need their appropriate management. Occasionally it depends on serious organic disease of the heart, or on kidney affections (as Bright's disease), and then cannot be cured. Elderly people becoming afflicted with this indigestion, will sink into wasting marasmus.

The laws of digestion, and the general rules that should govern men in eating and drinking, have been discussed in the first part of this volume. A proper regulation of one's dietary is of the first importance in this as in all other forms of indigestion. It is simply impossible to manage it without such regulation. Tonics and bitters and other medicinal compounds will prove in-

effectual, unless the habits of eating and drinking be regulated to the conditions and demands of the stomach. So long as the stomach is improperly fed, it will not be able to recover its natural condition. Yet many difficulties present themselves in adapting a 'dietary to these cases, even with the best general rules carefully before us; for experience shows that each person is more or less peculiar in the foods he can use, and that a selection of articles that will be thoroughly acceptable to one may prove quite objectionable to another. We cannot fully understand why this is so in some cases; but the fact itself is well known, and therefore must be recognized. No positive selection of foods must be laid down, and then enforced for all cases without regard for what some people are disposed to laugh at as "whims in eating." Let the personal choice of each stomach be ascertained; and then let the food be chosen rigidly from that list, and scrupulously confined to it without any experiments being made with articles that have proven to be objectionable.

I have noticed a few general facts in relation to the selection of foods, which have served me as a general guide. While they are not infallible, they will certainly be found very suggestive.

When the gaseous eructations are without taste or smell, articles that are starchy will generally ferment with the greatest rapidity; among which are bread, potatoes, corn, rice, and other farinas and starches. These are among our commonest foods, and are supposed always to be most easy of digestion by a weak stomach; yet in this class of cases they should be used only in limited amounts. Lean meats, eggs, cream, milk and buttermilk are usually the most acceptable, especially the lean meats. Right here let the observation be made that milk and eggs, although among the best of light foods, sometimes cannot be digested at all, while fair quantities of lean meats prove easy of digestion. In summer time, milk and eggs are least acceptable; and their continuous use, even by persons in good health, may then deprive the system of sufficient nutrition, and actually derange a good stomach and impoverish the blood if used in considerable quantities daily.

When the gaseous eructations are sour, acrid, scalding, of an offensive odor, causing burning feelings in the throat and a bad taste in the mouth, it is the common fact that sugars, sweets, oils, and fats will undergo fermentation most rapidly. In such conditions, foods of these classes must be limited to the smallest amounts or perhaps denied almost entirely except as oils exist to a limited

extent in some grains (p. 126). Now the aliment must consist most largely of the farinas and starches that were so unacceptable in the first class of cases; and generally may include limited quantities of the somewhat tart fruits, but cannot include fruits like peaches and grapes that contain sugar.

I say again that these are mere suggestions, and yet I have found them serve an excellent purpose in guiding me. A person in health cannot be confined to one particular class of foods (p. 128, 133), nor could this be done in disease. And yet it will soon be found that any and every case of indigestion can profit only by a *very few* articles of diet; and that when these have been ascertained, they must be used with decided regard to their acceptability, and this dietary (though very narrow) cannot be changed or enlarged except in the most cautious and guarded manner.

The form of cooking influences digestibility. Eggs should be soft boiled or poached, but never fried or baked. Meats are best broiled or roasted, and always eaten pretty rare,—the juices being but just changed in color, or not even that if a taste for greater rareness can be cultivated. Meats should also usually be deprived of surplus fat, the leanest muscle containing a sufficient amount of fat. Some persons can merely chew the meats, swallowing the juice but rejecting the fibre. Meats fried to a brown or dry crisp are very objectionable; roasts are much more tender than is generally supposed; and salted meats, salted fish, and pork are usually execrable for these stomachs.

Digestion is greatly aided by the use of such articles as pepsin and lacto-peptine. These in a considerable measure supply the deficiency of the gastric juice, and act upon the food as that juice does. Pepsin is the stronger preparation, lacto-peptine the milder and more suitable for children and delicate persons. Pancreatin is employed for the same purpose, from the "sweet-breads" of animals. Pepsin and lacto-peptine should be given immediately *before* eating. It is many times a decided advantage to use the peptonized foods, a list of which will be given in another part of this volume.

Gravies, greasy sauces, pastry, cakes, cheese, pickles, and coffee, are not to be permitted. Bread should not be fresh, yet should not be utterly stale. Yeast bread is quite unacceptable to some, bread of salt-rising may be equally so to others. Vegetables of the coarser classes are not allowable, and all vegetables and fruits must be tested with caution, yet some are needed.

Considering the acrid feelings that arise in the throat, and the general sourness of materials spit up, it is a common belief that all acids must be avoided in these cases. But this is a great mistake. Vegetable acids are demanded for the general health of the system (p. 129); and if the stomach is too long deprived of them, it will lose power to make good gastric juice. The sourness of this indigestion is from chemical changes in the food, which changes would be prevented were the gastric juice strong enough. By using the tart fruits in moderation, direct benefit will be derived; and many times the clear juice of the lemon may be poured upon meats, or taken by itself, to very decided advantage. Of course, as with other things, it can be carried to excess. Cider vinegar is at times equally acceptable.

Some of these conditions are pretty directly produced by the use of too much fluids, and all will be aggravated by it. Excessive use of water will dilute the gastric juice and render the walls of the stomach flabby; large draughts of iced-water are chilling, and promote congestion of the stomach; "hard" water may quite neutralize the gastric juice (p. 54). With some persons, all soups and broths and gruels are too relaxing to this organ, and then should be avoided; foods in dryer forms being preferable in themselves, and proving of double advantage by necessitating that slow and thorough mastication which is required at all times, and which is decidedly neglected in that hasty eating which lays the foundation of so many of these cases. Others profit most decidedly by soups and broths, and not on solid foods. The amount of fluid of any kind used in drink should be limited, and at meal-times should be small. Quite warm drinks are usually much to be preferred to cold; and many persons, especially thin people, find an advantage in arousing a full circulation in the stomach by sipping a half cup or more of quite hot water half an hour before breakfast. This habit may be continued for several weeks, then discontinued for a time and renewed later. Coffee is quite objectionable as a drink; and when tea is used, it should be in moderation.

This form of indigestion is commonly present in anæmia; and in turn it will always aggravate an anæmia by depriving the blood of sufficient aliment. By remembering these facts, it will be seen that any attempt to "starve out" an indigestion can but result in disaster. The quantity of food needed will be much less than a gormand has been accustomed to using; and he may look upon the amount allowed as insufficient to sustain life, though it

be ample for his digestive powers. But when one brings himself down to a cracker or a few bits of bread or a small potato for a meal, and lets his stomach keep almost craving hungry, he will surely impoverish the blood and render the gastric juice even weaker than it was before. In like manner, the *total* rejection of any one class of foods—as of animal foods by some, or vegetables by others—is a violation of the principles of correct eating already pointed out. While caution in amounts is always an absolute necessity, the quantity is to be such as is found fairly digestible without discomfort. And while each person will find it advisable to restrict himself as to certain classes of articles, it is a mistake and a source of mischief permanently to reject each and every article in that class.

In almost every case, the bowels require constant attention. All severe purgatives must be avoided, for they will assuredly increase the feebleness of the digestive organs. In a measure, due attention to the diet, as directed in the chapter on Constipation, will materially assist in accomplishing this object. Bran, in Graham bread or alone, often helps to clear away the tenacious mucus; so does salt with some persons, but its large use is not advisable. Rhubarb with senna is a suitable physic; so is butternut with rhubarb or with wahoo; for a moderate use of such articles promotes the muscular movements of the bowels, which are always feeble in these cases. Care should be taken to keep the liver in good tone and gentle action, when there are signs of biliousness. Rochelle or Epsom salts, purgative mineral waters, and other articles that incline to cause thin stools, are unadvisable or even damaging.

With the distress caused by the sour contents of the stomach comes a desire to use soda or other alkali. These give a certain desirable measure of relief, and also serve a fair purpose (especially if taken before breakfast) in detaching the tough mucus from the stomach and hastening it downward. An eighth or even a fourth of an even teaspoonful of cooking soda, dissolved in one-third of a teacup of water, may be taken slowly; but it should never be taken too near to a meal, either before or after, lest it completely neutralize the gastric juice and so add to the general trouble. It can never *cure* indigestion, and should be used only occasionally and on compulsion for a present relief.

The amount of tough mucus or “cold phlegm” that accumulates in the stomach, is sometimes very great. It hinders the

weak gastric juice from passing to the food; or envelops the food so completely as to shield it from the reach of the digestive fluid. In such conditions, the indigestion becomes notably increased, the distress in the stomach aggravated, the extremities get cold and the surface pale, and the general feelings of wretchedness are aggravated. An emetic is then a most proper measure; and the great degree of relief it brings to the entire list of bad feelings, is simply astonishing. Large quantities of glutinous material will probably be ejected, with some exceedingly offensive food and acrid water; and at once the sufferer feels freed from a great burden, and his digestion is probably improved for many days after. An emetic given for this purpose should always contain considerable bayberry or other astringent, to coagulate the mucus and thus secure its more thorough removal. Composition tea is very suitable to use for this purpose, as directed in the article on emetics. The emetic should always be followed by some of the tonics that contain astringency, as a portion of dogwood or gum kino with such other articles as are in use.

So great and prompt is the relief obtained from an emetic, that it seems natural to conclude that its repetition with sufficient frequency would quickly cure any case. But this would be a mistake; and an emetic should be repeated only when the distresses above named become again severe, which may be in a few days, weeks, or months. Put off their use as long as can be done reasonably, but do not delay when the signs of great accumulations of mucus have become severe and the mental apprehensions of the patient are increasing. Of course no emetic is to be used if this form of indigestion is accompanied with the tenderness and burning of stomach inflammation or ulceration.

A sour stomach, as well as a sluggish and obstructed liver, will usually cause a cool surface with quite cold hands and feet. It is always advisable to promote warmth of the surface in this indigestion by tepid or warm baths, warm salt-water baths, and friction, at moderate intervals.

Tonics are of advantage, provided they are given as secondary to the above measures. Simply to prepare some good "bitters" and then rely upon it, is to fail. Having pursued the above plan, the Nervine Tonic will be found suitable; or golden seal with American colombo; or these with a little scullcap; or a mixture of two parts dogwood bark and one part each boneset and balmony. The combination of such bitter articles is almost endless, and they

may be varied from time to time, usually proving most serviceable when given in moderate quantities. Generally it will be found best to use some one of the astringent tonics in fair proportions; as astringent action consolidates the mucus in the stomach, and favors its detachment and removal. Among these astringent tonics are wild cherry bark, dogwood bark, yellow poplar bark, American colombo, Peruvian bark. I have frequently found the gum kino, which is among the more active astringents, serve a most admirable purpose when used in small proportions with other tonics; and it has an advantage in not constipating the bowels as some of the astringents might do. Such tonics are, I believe, best used about an hour and a half after the meals, rather than nearer the meal times. Some of the iron preparations mentioned elsewhere in this volume, often prove admirable tonics in these cases.

It is very desirable to check fermentation of the food, if this can be accomplished. The use of soda for this purpose has already been mentioned. Many times a tablespoonful or two of lime water is more advisable, as it is less likely to interfere with the gastric juice and may be taken soon after a meal. I many more times have found that the solution of hyposulphite of soda, two doses of a teaspoonful twenty minutes apart, is admirable for this purpose—arresting fermentation quite promptly and also detaching the tenacious mucus. A grain or two of powdered gum myrrh is a good antiseptic, but some stomachs do not receive it kindly.

To aid in expelling the flatulence, a little peppermint, fennel, cummin, dill, ginger, or other carminative, may be used alone or added to the other medicines, as required. The peculiar acrid feeling in the throat which is known as *heartburn*, but with which the heart has nothing whatever to do, is often relieved by one or two tablespoonfuls of lime water, and a large dose of powdered magnesia to move the bowels. *Waterbrash* shows a greater laxity than usual of the coats of the stomach, and is best met by a few small doses of an astringent a few minutes apart,—such as half a teaspoonful of kino tincture, or a strong tea of witch-hazle or beth root.

Vomiting occasionally becomes distressing, and at times is very persistent. It is provoked by various conditions, and can be relieved only as these are searched out and remedied. Sometimes it is due to constipation of the lower bowel, calling for a daily enema; or of the liver and upper bowel, calling for small doses

of wahoo or cascara every eight or six hours to get the bile discharged and to keep it so. Very protracted vomiting may seem to reverse the entire motions of the bowels, carrying the faeces upward instead of downward. This would soon become a serious affair ; and as physic will not remain in the stomach, a large injection of a pretty strong infusion of senna with some salt must be given to restore the downward muscular movements. If provoked by a sour stomach, lime water, soda, magnesia or other alkali is to be used in small quantities and at short intervals. But sometimes the contents of the stomach are already too alkaline, the bile and pancreatic juices having been regurgitated. In such cases an alkali will not "settle the stomach," but is more likely to increase the weakening nausea and induce more vomiting. An acid is then to be given, as a few drops of vinegar in water at short intervals, or cream-of-tartar in water, or currant juice. Solution of soda hyposulphite has the advantage of being mildly acidulous, and also of arresting the decomposition of food in the stomach, and so may prove exceedingly serviceable for this vomiting. Accumulations of very bad and half corrupt mucus will call for an emetic, as above mentioned. Some extreme cases are so prolonged as to threaten life, it being impossible to keep any food on the stomach ; and then the patient must be fed for many days by the bowel, suck minute pieces of ice to allay sympathetic irritation of the stomach, and resume the use of food very guardedly as in chronic inflammation. In these latter cases, and often in some of the others, stimulating liniment over the stomach three times a day is of much service. Sometimes, in women, this vomiting is chiefly hysterical, from sympathy with general nervousness and an irritable womb. The female disease must then be treated, and the patient urged to make every effort of the will to resist the vomitings.

The mental condition of these patients will at times become a source of great annoyance, at others of decided anxiety. It is well right here to dismiss all idea of this causing insanity ; but when other and potent causes of insanity already exist, *then* a severe catarrhal indigestion with obstinate costiveness may become a direct excitatory cause to develop what before lay hidden. But, wholly apart from such a possibility, this and other forms of indigestion bring a great deal of mental depression and disturbance, causing much unhappiness to the patient and to his family. It is useless to laugh at his fears and gloom ; for to him it is all *real*,

and jocularity but increases his despondency. It is bad to fall into full sympathy with his feelings, for such sympathy directly intensifies them all. Sternness is cruelty itself, and will drive the sensitive to despair or to ruin. The conditions require the utmost patience, coupled with the utmost discretion; gentle cheerfulness; adroit withdrawing of the patient's attention to other objects than himself; and judicious explanation, repeated at intervals, that the mental gloom and apprehension naturally flow from the state of the health, that no really insane person ever feared for his own sanity, that things are by no means so hopeless as they seem to be, and that the feelings are to be struggled against manfully while measures are being taken to overcome the conditions of stomach and nerves that cause them. By such a course, carried out with the greatest care and most prolonged patience by family and friends, the whole mental trouble will in due time be put right. When it is possible to supplement this course by travel in easy stages, the progress will be much more rapid and the results highly satisfactory.

CHAPTER XXXV.

DYSPEPSIA. NERVOUS DYSPEPSIA.

ALL forms of indigestion used to be called dyspepsia; but various forms of stomach failure have been described in the two preceding chapters, and the term dyspepsia is now given to a different class. It is not associated with irritation of the stomach, as in chronic gastritis, but quite the opposite. Neither is it combined with large accumulations of tough mucus, as in catarrhal indigestion. This dyspepsia consists in a great lack of tone in the walls of the stomach, there being too little muscular power to move the food about as is required for its digestion. At the same time the gastric juice is deficient in quantity and poor in quality; but the walls of the stomach are not swollen, softened, thickened, or otherwise changed. Simply there is great diminution of nervous force, and the offices of the stomach fail to be performed.

Symptoms.—All forms of indigestion give impairment of appetite, gaseous accumulations from fermenting food, sense of oppression in the stomach, disturbances of the bowels with a decided

tendency to constipation, and various degrees of heartburn and water brash. Atonic dyspepsia gives these, and in addition to them the following symptoms:

The stomach feels full and heavy, with a sense of weight, but without soreness or tenderness—pressure on it often affording quite a sense of relief. Eructations of gas are nearly constant, and often are quite offensive. The tongue is probably large, flabby, pale, somewhat moist, a little furred. Constipation is habitual and quite obstinate, the muscular walls of the bowels lacking the power to perform their natural movements ; the stools are dry and hard, pale, and commonly offensive. Pulse weak and easily hurried ; palpitation, headache and dizziness common ; feelings of tightness and oppression across the chest ; shortness of breath on exertion ; frequently a short, hacking and perfectly dry cough without any evidences of lung irritation. Most of these patients are pale and emaciated, with a shrivelled-up countenance and woe-begone expression ; and in mind they are peevish, irritable, full of gloomy forebodings, thinking constantly of themselves with every conceivable form of whimsical imagining and terror. The perversions of disposition, and lack of mental firmness and vigor, are prominent symptoms, and sources of great distress. Indeed the whole nervous system is wonderfully disturbed and weakened. These patients, unlike those of gastric catarrh, usually have a liking for spices and condiments, and can use them without distress and generally with benefit.

Most of these cases are due to sedentary habits, prolonged anxiety in business, or mental over-strain. The mental strain alone would scarcely cause it ; but when such strain is added to insufficient muscular exertion, and to these some improprieties in living, the gradual exhaustion of the entire nervous system is felt most prominently in the failure at the stomach. And this general condition of nervous fatigue in turn causes the most distinct loss of mental force in dyspeptics. These people especially suffer from any efforts at mental or physical exertion undertaken too soon after meals. Alcohol and tobacco greatly favor its development ; and those who have been accustomed to high seasoning in their food, would so miss their habitual excitants as suddenly to fall into this atonic dyspepsia if these were withdrawn late in life,—one of many facts to admonish against high seasoning in early life, when the stomach should do its work without such artificial goads.

Treatment.—Development is slow and the difficulty lasts long. As in other indigestions, the regulation of the diet is to be attended to first and constantly. The character of the foods must be plain, and of such kinds as are found to be most acceptable to the stomach; the amount must always be moderate, the evening meal being the lightest so as to promote an appetite for breakfast. Fluid forms of food are mostly objectionable, because diluting the little gastric juice there is; hence soups and broths are to be used with much caution, pretty dry foods with thorough mastication is to be the rule, and little or no fluid should be taken at or near the meals. Pastry and sweets are objectionable, acid fruits generally acceptable. One used to high seasoning must withdraw the spices gradually, so as not too abruptly to leave the stomach without the stimulation it has been accustomed to depend upon; but all forms of alcohol, when used, must be laid aside at once, as their action is directly antagonistic to the gastric juice.

It is in these cases that the general class of bitter tonics is most acceptable, and can be depended on much more fully than in the catarrhal indigestion described in the last chapter. And such tonics should always embrace a goodly share of those which act in support of the nervous system,—of which scullcap and dioscorea are among the best. The Spiced Bitters is a good formula; the Nervine Tonic is suitable; but combinations may be made of golden seal, boneset, colombo, balmony, and others of the same class. Gentian may be added to any of these in small quantities; and quassia is an old favorite with many persons. Whatever combination of such tonics is used, it is advisable to change about among them from time to time. The form of infusion is the best, even though more inconvenient; and syrups and tinctures are not often admissible. A change to the form of dry powder is many times advisable; and powders may be given in capsules when desired, or in pills. Concentrated preparations are best used in capsules; and a good one is two grains scutellarin, one grain chelonin, and half a grain hydrastin. Or salicin may be substituted for the chelonin. I have often used a "dinner pill" made as follows; lobelia seeds twenty grains, scullcap and cayenne each ten grains, mixed in softened extract of boneset and made into pills of moderate size, of which one or two may be taken at meals. Another good pill may be made of two parts lobelia seeds, one part each of scullcap and myrrh, one-half part each cayenne and calamus, in extract.

But the number of good tonic compounds that can be made, is almost endless. It is advisable to mingle with them a small portion of mildly stimulating articles and such as will aid in expelling the flatulence, such as ginger, prickly ash bark, calamus, dill or fennel seed, cummin, etc. While such spicy agents are not appropriate in catarrhal indigestion, they are more or less demanded here. It is well to give the tonics within twenty minutes after the meals, and to use pepsin (dry) with a few drops of vinegar immediately before the meals. The usual dose of pepsin must be about doubled, in order to be effective.

And the natural muscular movements of the stomach and bowels are here so deficient, that it is important to aid them with gentle but regular kneading movements. These should be practiced after each meal, beginning about an hour after eating and continuing ten or fifteen minutes,—making the motions rather slowly and somewhat deeply with the fists, and extending them over the entire abdomen. Decided benefit will be derived from this course, not only to digestion but in promoting evacuations from the bowels. For this latter purpose, the use of bran, salt in water, cracked wheat and the fruits will be necessary, as directed in the chapter on constipation.

While costiveness is often very obstinate, and must of necessity be relieved, it is never allowable to do this by harsh physic. Always help the bowels to gain strength by tonic laxatives, securing just one fair motion each day. Compound Butternut Syrup is good for this purpose, or the Butternut Pills, or Leptandrin Pills,—changing from one to the other from time to time.

As this form of indigestion prevails mostly among people of sedentary habits,—students, professional men, retired gentlemen, book-keepers, clerks, seamstresses, and others who are kept much in-doors and have very little muscular exertion,—it is of great importance that such habits should be changed so far as possible, and daily out-door exercise obtained. This subject has been fully treated of in the chapters on Exercise and Overwork in Part I of this volume. Brain work must be notably lessened, and out-door exertion of some adequate kind be provided,—walking, horse-back riding, gentle rowing, tilling a small ground, or something else in moderation,—one's individual circumstances determining the form in which that exercise is taken. If nothing better can be had, then use in-door gymnastics in addition to out-door walking, but avoid *over-exertion* in any muscular direction. And these

people must also be diverted and stop thinking of themselves so constantly as they do. Cheerful company, and deep and hearty laughing are of incalculable benefit in shaking up the stomach and starting the blood. Dull melancholy moping, fits of "the blues", and indisposition to stir around and take a fair amount of daily exertion, must be fought against and overcome by good will-power.

CHAPTER XXXVI.

BLEEDING FROM THE STOMACH.

BLEEDING into the stomach may occur in several different diseases, as also from severe blows or other injuries over the organ. Among the troubles causing it are hardening and other changes in the liver, tumors within the abdomen pressing upon the great veins, the breaking down of the stomach vessels by ulcers or cancer, rupture of the large vessels by aneurism; and such reducing diseases as anaemia, scurvy, and yellow fever. Enlargement of the spleen has sometimes been its cause. A curious case is occasionally met, where the menses of woman partly or wholly escape by the stomach (as also by the lungs) instead of by the natural channel,—these cases being called vicarious menstruation, and sometimes continuing for years without serious detriment to the health.

The amount of blood lost may vary from a few drops mingled with food, and causing no perceptible inconvenience; to a flow so sudden and large as to be a shock to the system and cause faintness, prostration, or even sudden death. In ulcers and pressing tumors, an attack may be expected at any moment. It may give no warning whatever; or it may be preceded by slight chilliness, a sensation of heat in the stomach, and pain between the shoulders.

When the flow begins, delicate persons become pale and cold; the robust are not likely to suffer unless the flow is large. Considerable losses cause great and sudden pallor, dizziness, decided faintness or complete fainting, and cold perspiration. Soon a warm and sweetish fluid rises in the throat, and then blood is ejected or vomited. It is usually dark-brown in color, from the

action on it of the acid juices of the stomach; and may be in a soft clot, or broken up like coffee-grounds, or like tar. In large and rapid bleedings the stomach juices have no time to act upon it, and then it is bright red, fluid and vomited quickly. In a day or two after a stomach bleeding, blood appears in the stools,—black and clotted if passed soon, tarry and offensive if passed late. In some diseases of the liver and spleen, blood may appear in the stools without any having been vomited.

Treatment.—Stomach bleeding is to be arrested by such astringent or styptic preparations as the stomach will receive without being incited to further vomiting. Among the best of these are kino and tannin, which may be dissolved in warm water, and a teaspoonful or tablespoonful given every five or ten minutes according to the amount of bleeding. Much larger quantities may be given, if required, and if the stomach will receive them kindly; but it is generally best to give small doses at short intervals. Oak bark, sumac bark, hemlock bark, dogwood bark, are also reliable astringents, and may be used in infusion. At the same time divert the current of blood away from the stomach as much as possible by bathing the feet and hands with quite hot water, into which pepper, mustard or salt may be thrown. Let the patient lie down and keep as absolutely quiet as possible. He must keep very still for several days after an attack, use only soft and light foods, and gradually tone up the stomach with mild tonics,—as the Nervine Tonic. It is usually necessary to continue some astringent—as dogwood bark—in the tonics for several days. When the bowels need moving, give no physic whatever but depend on tepid enemas containing salt. Ulcers of the stomach are to be managed as directed in another chapter; and in vicarious menstruation nothing is to be done to check this bleeding, but subsequently gentle steps must be taken to restore the menses, as directed in my WOMAN'S BOOK of HEALTH.

CHAPTER XXXVII.

ULCER OF THE STOMACH.

WOMEN are most frequently troubled with ulcer of the stomach, but men are not strangers to it. It usually occurs during the middle periods of life, and among the feeble and debilitated; and

it slowly increases this debility by gravely interfering with nutrition. "High livers" are quite subject to it, including those who make use of alcoholic drinks even in moderation. It is a very common affliction among daily tipplers. Any part of the stomach may be ulcerated.

Symptoms.—As a rule, the development and progress of a stomach ulcer are slow, occupying years. It is always accompanied by the general symptoms of chronic catarrhal indigestion, as described in that chapter; and indeed this form of disease, by weakening and softening the surface coats of the stomach, always precedes ulcers and is liable to terminate in them. And there will always be an inflamed condition under and around these ulcers, so that the symptoms of chronic inflammation are also present in considerable degree. Hence the signs of stomach ulcer are exceedingly various and uncertain. Its most general history will be as follows:

A wearying, burning, gnawing, and nearly constant pain in the stomach; which pain is limited in area and increased by pressure directly over the site of the ulcer. If the ulcer is on the posterior wall of the stomach, the pain and tenderness seem to be in the spine, or will be felt in the back near the spine. Suffering is also increased by tight clothing; and always by hot food or drinks, stimulating or coarse foods, and by sugar; and usually there is a period of severe distress after every meal, though an occasional case shows a brief period of relief after taking soft foods. Throbbing in the stomach after eating is common, vomiting of food and sour mucus is not infrequent; and small blood vessels at last break down and blood is found in the vomited matters—a conclusive sign of ulcer.

Flatulence, water-brash, heartburn, etc., are nearly constant. Costiveness is rather obstinate, with occasional brief spells of diarrhoea. Nutrition fails slowly, there being general wasting, and finally anaemia. Females have menstrual disturbances. The tongue is usually red, furrowed and inclined to be smooth. While the appetite is decidedly impaired, there are times when it is likely to be entirely too acute and indulged in with painful consequences. All the symptoms may at times improve, and the sufferer appear to be on the way to early recovery; and then a single slight indiscretion in eating, drinking or exertion will seem to tear open the healing sores, and in a few hours every distress returns.

Treatment.—Dietetic regulations are here, as in other stomach affections, of the first importance; and the foods must always be

of a non-irritating character and of easy digestion, pretty much as has been laid down for chronic inflammation. Spices, sugar, stimulants, and all harsh and coarse foods must be laid aside at once and continuously; and so of tea, coffee and meats. A few plain articles, and such as are found to be most acceptable, are to be relied on; such as rice, corn starch, barley, milk with lime water, and eggs; and it is generally found impossible to extend the selection of food outside of a few articles for a long time, and then only with the utmost caution. Even such rigid regulation of the aliment may be found insufficient in some extreme cases; and then it will be necessary for a time to sustain life by nourishing enemas, as of milk, barley water, eggs, beef essence, etc., as directed in the part on nursing. Such feeding may have to be persisted in for weeks, and possibly for months; and in such cases the sufferer may have to keep his bed or lounge a large portion of the time. In all cases, it is desirable to refrain from active exertion, which causes too much motion in the walls of the stomach besides making more demands on the general strength than can be sustained; and those engaged in muscular occupations must lay them aside and find lighter employment.

Attacks of pain and vomiting may be met by the Nervine Liniment or other moderate stimulant over the stomach two or three times a day; toast water, or the water off of popped corn, or broth from boiled chicken gizzards in small quantities; and a teaspoonful of lady slipper in thin starch water by enema every three hours to be retained. Sometimes a fomentation of hops over the stomach gives relief; a teaspoonful of an infusion of cherry bark at short intervals is often acceptable; and those troubled with sour eructations may at times obtain relief by using a few grains of cooking soda, as in catarrhal indigestion. Distress in the back is at times benefited by Nervine Liniment, or by application of pretty hot water for a few minutes at a time. If blood should appear to any considerable extent, it must be checked by the use of some astringent that will be acceptable to the stomach,—among the milder of which are infusions of raspberry leaves, blackberry root, beth root, witch-hazle leaves; while among the stronger for suddenly dangerous and obstinate cases are kino gum, sumac and hemlock bark, and tannin. Quite small doses every few minutes till the vomiting of blood is checked, is the better mode of giving such articles. Costiveness is to be relieved by injections of boneset, catnip, or some similar article, physic being inadmissible.

For directly aiding in the healing of the ulcer, only a few articles can be added to the influence of diet and rest. Among these, a weak infusion of wild cherry bark given in tablespoon doses every three or two hours, is one of the best. A very weak infusion of golden seal is also good; and a grain of hydrastis phosphate in four ounces of water, is often particularly efficacious, a teaspoonful four times a day with the cherry infusion between doses. Sometimes the stomach will receive this with two grains of powdered myrrh in the four ounces. No medicine is to be given in the syrup form, for sugar is objectionable.

When an ulcer of the stomach corrodes deeply, it may perforate the walls and cause almost immediately fatal bleeding internally; or let the contents of the stomach escape into the cavity of the abdomen, and be followed in two or three days by peritoneal inflammation and death. The occurrence of such a perforation is generally known by a sudden feeling as of tearing in the stomach, with strange prostrated and sinking sensations. Early death is inevitable when this misfortune occurs.

Cancer of the stomach is fortunately a very rare disease. It usually presents the combined symptoms of catarrhal indigestion and stomach ulcer, both steadily increasing in severity; with attacks of severe lancinating pain that cannot be mitigated, the appearance of blood in the matters vomited, in time a tumor in the stomach, an ashy-yellow countenance, and a fatal termination in about twelve months.

CHAPTER XXXVIII.

COLIC. WIND COLIC.

FLATULENT or *Wind Colic* consists of pains in the abdomen, most severe and frequent in the neighborhood of the umbilicus, but moving from place to place through the intestines. Sometimes the pains are light, coming and going irregularly; at other times they are very severe, causing intense agony, the patient bending forward or leaning his abdomen against some hard body while the paroxysm lasts. These sufferings recur at more or less rapid intervals, abating suddenly or ceasing entirely for a few

moments till another pain returns. Firm and steady pressure on the abdomen affords relief, the bowels are usually distended to some degree with flatus, there is no fever but may be some nausea or vomiting, the countenance looks pale and pinched under such suffering, the face and extremities are generally cold; and sometimes a violent case causes general paleness and coldness, an abundant cold perspiration, and a feeble and slow pulse. Constipation is present. A free discharge from the bowels, or an ejection of flatus, brings relief. The first discharges are usually green, very offensive and acid; afterward the bowels may become loose. In summer, especially among children, colic may precede and accompany diarrhoea, and end in dysentery.

Indigestion is the common provocative of wind colic, the small intestines becoming distended with the gases of fermenting food. Acrid, coarse foods, unripe fruits, and over eating, are the usual causes of summer colic and diarrhoea. *Bilious* colic is the form of paroxysmal suffering due to obstructed gall ducts and the passage of gall stones. (*See Gall Stones*). A fearful *renal* colic is often provoked by small calculi passing from the kidney to the bladder.

Treatment—If unwholesome food is in the stomach, or if the person has recently eaten very heartily and the food has not digested, an emetic should be given at once so as to dislodge the offending material quickly. A tablespoonful of salt in a cup of warm water, or in weak composition tea, will be suitable; and may be repeated in ten or fifteen minutes if needed, or aided by tickling the fauces with a feather or the finger. Follow this with one to two tablespoonfuls of the Neutralizing Cordial, or use the Cordial without the emetic if the latter is unnecessary, and repeat every ten to twenty minutes till several doses have been given. A teaspoonful of powdered magnesia may be used instead of the Cordial, and repeated every hour or two for three doses. Some essence of peppermint, or anise, or tincture of ginger, or warm ginger and cinnamon tea, should be used with the magnesia; and repeated at short intervals without the magnesia. If neither magnesia nor cordial is at hand, ten or twenty grains of soda bicarbonate (cooking soda) may be given in warm water, and repeated in an hour or so.

Unload the bowels as soon as possible by a large enema, if they have not moved recently or do not incline to move spontaneously. For this purpose the enema should consist of a pint of tepid water containing a little ginger; or some lard, or oil, or a

pretty strong infusion of catnip, or some lady slipper. A free evacuation from the bowels is imperative.

The above medicines should be aided by stimulating appliances over the abdomen, as of Nervine followed by hot plates or bricks; or hot bags of sand, liniment, or cloths wrung out of a hot infusion of red pepper and vinegar, or cloths from mustard and salt infusion, or a fomentation of smart weed, or a weak mustard paste for a few minutes, or a hop and spice fomentation, or large mustard poultice with cayenne. Severe cases require such outward stimulation to be used with great vigor, renewed as they get cool, and aided by four or more thicknesses of very hot dry flannel laid over the wet appliances. The mustard leaves or capsicum plasters, now kept by druggists, are excellent and convenient preparations for these purposes, requiring merely to be wet for a few moments in warm water. A hot foot bath, with some red pepper or mustard, is desirable; and the feet should be kept warm, always. A flat rubber bag, or a tin vessel of proper shape, may be filled with hot water and laid against the abdomen, the patient being well covered.

Besides such carminatives as peppermint, anise and ginger, the wind may be expelled by such articles as fennel, angelica, catnip, or lavender. *Dioscorea* (colic root) is admirable to relieve the crampings, and may be used with ginger and mint by warm infusion. All such articles should be given every twenty minutes, or even every ten, till relief has been obtained. The Spiced Tea is often suitable.

After an attack of colic, the diet should be very light and plain, lest inflammation set in or another attack be provoked. The bowels must be kept in daily action, as by magnesia, rhubarb and magnesia, or the Neutralizing Cordial with a teaspoonful of glycerine. Children subject to colic should wear a couple of thicknesses of soft flannel, or a thin spice-bag, over the abdomen; and should be guarded carefully against over feeding.

A hernia or rupture sometimes gives pains resembling colic, and should not be passed by without examination.

CHAPTER XXXIX.

PERITONEAL INFLAMMATION. PERITONITIS.

THE peritoneum is a thin membrane, almost transparent, a double fold of which envelopes the bowels—lining the abdomen just underneath the muscular walls. It is subject to inflammation from outward injuries and violence; and also from the perforation of the stomach by an ulcer of the bowels, by ulcer in typhoid fever, of an abscess of the liver, etc. It is not a common affliction, but is always a very dangerous one. Women who have recently become mothers are liable to a fever (puerperal fever) which includes inflammation of the peritoneum, and which is described in my WOMAN'S BOOK OF HEALTH.

Symptoms.—It begins suddenly with chilliness that may not be severe, but is likely to be prolonged at intervals through several hours. At the same time the abdomen becomes painful and tender, the pain extending pretty generally over the abdomen and being sharply increased by pressure and even by very slight movements of the body. Deep breathing, turning in the bed, and other ordinary motions cause keen suffering; so the patient lies very still, generally turns upon the back and lifts the knees a little as the most easy position, complains at any attempt to change his posture or to touch the abdomen, and does not breathe deeply. Fever soon comes on, with an exceedingly frequent but small pulse. Vomiting is probable in from a few hours to a day or more, and is very distressing. Constipation is at once notable. In from one to two days the abdomen swells, and this swelling presently becomes great and sounds drum-like. In three or four days, unless a favorable change is obtained, the sufferer becomes delirious, obtains no sleep, and begins to lose ground rapidly. Fatal cases terminate usually within a week, but may linger a few days longer.

Treatment.—When caused by internal perforations, there are almost no hopes of recovery; but when brought on by violences, it is possible to save many cases, even when the injury is severe. Keep the patient thoroughly quiet and still. Unload the bowels at once with a pretty large and soothing injection, as of starch water, with catnip or lady slipper, but carefully avoid physic; and even the injection need not be repeated so as to move the bowels for three or four days, if a free evacuation has been obtained at

the start. Bathe the abdomen with Nervine Liniment every three hours, and apply pretty hot poultices of flaxseed containing one-eighth part of lobelia and half that much ginger. These poultices should cover a large surface, but must be made light lest their weight be a cause of painful pressure; and they must be renewed every hour, or as often as they become a little cool. If the feet become cool, place to them and along the sides of the limbs hot irons or bricks wrapped in moist cloths.

While pursuing these plans, give every half hour a warm infusion of four parts white root, one part ginger, and one-half part camomile; or any other prompt and soothing sweating articles may be used, together with some lady slipper to benefit the nerves. Only moderate quantities can be given at a time, as the stomach is generally too irritable to take more than two or three tablespoonfuls; hence the greater need of giving it at short intervals. If the pulse become very small, one part of blue cohosh may be added to the infusion, or a smaller portion of scullcap. When the progress is decidedly unfavorable, a profuse perspiration may break out and soon become cold and sticky; and then all sweating articles must be withheld. If recovery is secured, it will demand during convalescence the persistent use of the liniment for a long time, very mild tonics, and light diet with careful nursing.

CHAPTER XL.

INFLAMMATION OF THE BOWELS.

INFLAMMATION of the bowels is a troublesome disease, and in severe cases is full of danger. It may occur in the upper, middle, or lower bowel; and the symptoms vary considerably according to the position of the trouble. In mild and rather chronic cases, there is distress in the bowels an hour or two after eating, with some feverishness, feelings of weakness, and tenderness at some fixed point when deep and steady pressure is made on the abdomen. In more acute cases, these signs are much more distinct, the sharp tenderness on pressure serving to distinguish inflammation from colic and from the distresses that accompany many cases of indigestion. The skin is more or less hot and dry; thirst is

pretty constant, and more so if the upper bowel is most inflamed ; constipation is decided, and usually tempts to the use of strong physic as if it were a colic ; yet diarrhoea is most common if the lower bowel is inflamed, and dysentery is one form of this inflammation. Nausea and vomiting, occur with some ; if the duodenum is the seat of inflammation, sudden jaundice may set in after two to four days, and is extremely dangerous ; and if relief is not soon obtained, the pulse becomes small, soft and frequent, and the extremities and face may become cold and pale, which are dangerous signs. Children soon show signs of collapse, with pinched features, cold and blue extremities, hot abdomen, extreme fretfulness, with repeated short and feeble cries.

Inflammation is at times mistaken for simple wind colic, or for the colic of indigestion which gives pain near the navel. This mistake would be very awkward in treatment. Pressure made steadily and deeply increases pain and develops an area of tenderness in inflammation, and there is more or less hurrying of the pulse ; while the opposite facts obtain in colic, yet inflammation may develop on a severe or protracted colic.

Children during teething are most prone to inflammation of the bowels ; and it is common in summer when the days are very hot and the nights cool and moist. But it may occur at any age, and those who have once suffered it are quite inclined to its recurrence. Its most common provocatives are irritating, harsh, ill-cooked foods, including unripe fruits used too freely, the sharp seeds of berries or cores of apples, and again an excessive flow of bile. Sudden colds may cause it in winter ; injuries over the abdomen, extensive burns upon the surface, swallowing any irritant poison, worms, hardened faeces, etc.

Treatment.—Costiveness when present tempts to the use of sharp purgatives, which may do for a colic but are totally out of place here. Nothing of this kind must be given in an inflammation. Unload the lower bowel with moderately large enemas of tepid water or catnip infusion ; and a similar but smaller injection given every four hours and retained, will greatly soothe the pain. Elm or flaxseed or barley water may be used steadily in this way ; and half or a whole teaspoonful of powdered lady slipper added to each injection, and retained. Irritating food in the intestines may be dislodged by a goodly dose of powdered magnesia. A tea of peach leaves, made fresh every twelve hours, may be given every hour, a couple of tablespoonfuls at a time, and is very

soothing and helps unload the bowels. A weak flaxseed or mal-lows infusion may be used in the same way. Over the abdomen lave the Nervine Liniment every six hours; and apply soft, light and rather warm flaxseed poultices, re-heating as they get cool. Keep the patient on his bed and as quiet as possible; bathe the feet and hands with warm water if they are cold; allow no iced drinks, nor more than a teaspoonful or two of cool water at a time, and frequently; but small pieces of ice may be allowed to melt in the mouth. A small Effervescent Draught occasionally, is very acceptable and may arrest nausea or vomiting.

Appetite and digestion are greatly impaired, and none but the blandest foods should be given, and these always in a liquid form. Beef tea with a few drops of lemon juice is sometimes acceptable, used cold. If the tongue is furred, the stomach may refuse to digest it but will favor its rapid putrefaction; and then it must not be used. Skimmed milk, with a teaspoonful of lime water to three ounces, is usually tolerated better than anything. Farinas and gruel are generally very objectionable, but sometimes they are well received. Learn which class of foods is best borne, and then use it in small quantities. Nourishing injections, as of thin barley water or weak beef tea, are sometimes the only available mode of sustentation, repeated every four hours.

If the case is protracted, the amount of fluid food must be fairly increased and made more sustaining. Constipation in such case must be guarded against by enemas; and the skin may be made use of by bathing the abdomen twice a day with beef tea well seasoned.

Convalescence must be guided very cautiously. Any sudden return to solid food is liable to provoke another attack that may end fatally in a short time. The tone of the stomach must slowly be coaxed back by a little cold infusion of boneset or camomile, the extremities kept warm, the bowels kept open by injections if needed, and the patient prevented from much exertion or motion. It is sometimes an exceedingly tedious trouble to recover from.

CHAPTER XLI.

CONSTIPATION. COSTIVENESS.

COSTIVENESS occurs in a large number of diseases, either as part of the malady or as a collateral incident to its conditions. Whenever present, it aggravates the common malady and its symptoms, and adds to them a variety of ill feelings which else would not exist. It interferes with the freedom and balance of the general circulation, promoting coldness of the feet, heat of the head, headache and internal obstructions, as of the liver, bladder and womb. It leaves in the alvine canal a burden of offensive materials, which are liable to be resorbed and measurably to poison the blood and to provoke fever. It impresses a sense of general malaise and depression upon the entire nervous system. In both acute and chronic diseases it is often quite troublesome, and sometimes impossible, to overcome the principal malady until constipation has been relieved.

Constipation as it occurs in fevers and many other cases, has been alluded to in the proper places; and in this chapter I wish to speak of it only as a chronic and habitual trouble. Some persons are strongly inclined to it from birth; others by sedentary habits, which do not secure a sufficient degree of motion in the muscular walls of the abdomen. Very many acquire it by inattention to Nature's calls to stool, by delay in which the responsive power of the intestines is lulled and obstinate costiveness may be fastened upon any person. Diet has an important influence many times, the use of meats and fine breads promoting it, the absence of fruits and the coarser succulent vegetables establishing it. In the great majority of instances the muscular strength of the lower bowels is weakened; in very many cases the bowels are dry from deficient secretions, causing abnormal dryness and hardness of the fæces; not infrequently both conditions exist at the same time, and piles (hemorrhoids) is a common result of hardened masses pressing upon the rectum. An inactive liver, or a failure of bile to escape from the ducts of the liver, cause a considerable number of these cases, as treated of under appropriate heads. Pressure upon the lower bowel by a misplaced womb, or by a swollen or enlarged ovary, causes numerous cases of costiveness, and are usually made worse by ordinary physics and can be remedied only by properly adjusting the womb and overcoming the ovarian trouble.

A first requisite in removing habitual sluggishness of the bowels, is prompt attention to the natural demands for an evacuation; and when this demand does not return, its re-establishment by going to stool at a regular hour even though not feeling the least desire to do so. The particular hour may be determined by one's mode of life, business, or convenience. Some prefer the early morning, others immediately after breakfast, others after supper or just before retiring, etc. It is of little consequence which hour it shall be; but when an hour is chosen, it should be adhered to with the utmost regularity for months or years, and nothing whatever be allowed to interfere with it. Let the water closet be visited; and an evacuation be *coaxed*, but never forced by harsh and hurried straining efforts which are quite certain to produce piles. Ample time must be taken to persuade the intestines into effective action; and if it be found nearly impossible to do this, then the syringe or other measures are to be employed to assist the object as hereafter mentioned.

One's diet should be regulated to favor peristaltic movements, according to the classes of articles the stomach will receive. Stewed prunes are among the best of the fruits for this purpose; apples in any acceptable form, pears, tomatoes, dates, tamarinds, and figs, are also excellent; and changes may be made in the use of these, as desirable. Oatmeal and cracked wheat are admirable; also the succulent vegetables in their season; corn meal; and flour with only the tougher outer bran removed, and the second and interval layer left with it. Fine white flour should be used but little, and meats in moderation.

Peristaltic action can be assisted and promoted by numerous measures. Half to a whole teaspoonful of table salt drank in a glass of cold water before breakfast, is a favorite with many; or a tablespoonful of moderately fine bran. Candy made from molasses or brown sugar is good at times, but cannot be used constantly and by some cannot be used at all. Slowly kneading the lower abdomen with the hands before going to stool, and again while in the closet, is a good practice. Many resort to the use of the syringe daily, continuing the practice for months or years. The injection should be taken fifteen or twenty minutes before stool, and retained thus till it has had time to arouse the rectum and soften its contents. Its bulk should be considerable, ordinarily about a pint. A variety of medicaments may be used in the injection, as, a tablespoonful or less of table salt; one quarter of an

even teaspoonful of powdered ginger, the salt and ginger together; an infusion of boneset, with or without a few grains of ginger, which is steadily strengthening; a very little mild soap in the water, but which often proves too irritating; a weak infusion of senna leaves. The syringe cannot be used with any comfort when piles exist, and often proves quite irritating to these.

Some prefer to use suppositories for obstinate torpor of the lower bowel, which may exist even when the middle and upper bowels are active. A suppository is made round, about the size of the little finger, tapering at one end, about an inch and a half long. The handiest home suppository is a slip of any real mild hard soap rolled and shaped properly. The common yellow soaps are entirely too harsh. Tallow mixed with one-fourth part of lard to keep it softer, and with a little powdered ginger incorporated, is good. Suppositories are used by gently inserting one for an inch or more into the rectum half an hour to an hour before the appointed time for going to stool.

Physics (cathartics) are very frequent necessities, but are too commonly relied upon to the neglect of a suitable dietary and a proper regulation of the habits. Such a course is unwise, often forcing and overworking the bowels, thereby increasing their sense of exhaustion instead of improving their tone. Strong, harsh physics, though often selected because a small dose will provoke copious movements, are always a detriment. No cathartic should be used except its action is mild; and its use should be considered as a present help to the diet and other evacuant measures, and then lessened in frequency or discontinued altogether so soon as it can be dispensed with. Saline purges (Epsom salts, Rochelle salts, Glauber salts, etc.) act promptly; but are not suitable for continued use, and their depletive action on the blood makes them improper for thin people. Citrate of magnesium is better, yet suited only for occasional use; the powdered magnesia, or the medicine known as Milk of Magnesia, being more adapted for repetition and for an acid condition of the stomach and bowels. Rhubarb root is used by many, a few grains eaten once or twice a day after a meal; and it promotes muscular action of the intestines, but inclines to leave their surfaces dry. Bark of the butternut tree is an excellent article, acting gently and always leaving tone in the bowels. It may be made into strong syrup, adding a very little golden seal and flavoring with essence of peppermint. A suitable portion of this may be taken at bedtime; and again after breakfast

if needed. Some prefer pills; and may slowly dry down a strong decoction of butternut to a solid consistence, and make it into pills with a little powdered golden seal. Senna added to butternut, in syrup form, acts more quickly but is not so desirable for continued use. A variety of cathartics, with the especial dose and action of each, will be found in another part of this volume.

CHAPTER XLII.

DIARRHŒA.

UNDER this term are included all cases where the movements of the bowels are thinner and more frequent than natural, and may or may not be accompanied with griping and colicky pains, but are not associated with fever nor with prolonged efforts at straining. When the discharges are small, mucous, bloody, provoke strong straining efforts, and are accompanied by fever, the case is a dysentery or other inflammation of the bowels, and should not be confused with diarrhoea. Sometimes a painful diarrhoea is a prelude to dysentery; and it may be due to tubercle (consumption), cholera, cholera morbus, and other diseases, as noticed at the proper places.

Diarrhoea is mostly a trouble of the summer months, when the heat relaxes the liver, and weakens the digestive powers. Errors in diet then provoke it readily, especially over-eating, indulgence in coarse and unwholesome foods, and the use of too much iced-water and other very cold drinks. Some people appear to be constitutionally inclined to this form of bowel troubles, and seldom escape an attack of it during the heated term. Children indulging in unripe fruits are very liable to it. Sudden checking of perspiration, taking cold and suppressing the menses, sitting with the feet cold and wet, and similar interferences with the skin functions, may provoke diarrhoea in summer or winter. Liver disturbances, giving an increased or unhealthy secretion of bile, frequently induce a "biliary" diarrhoea; and so do malarial influences in warm climates. It is mostly an acute malady; but may linger for weeks, or become chronic,—as after military exposures and exhaustion.

The discharges and other symptoms will vary according to

conditions. When caused by improper food or excess in eating, with deficient digestion, the stools are generally attended with pain and griping, rumbling in the bowels; follow soon after eating and contain portions of undigested food, or occur three or four hours after a meal and are free and offensive. In such cases the food ferments, and the bowels are occupied with the sour and irritating mass. When the liver is at fault, the tongue is foul; the discharges are pale if bile is deficient; greenish yellow or dark green if bile is of bad quality, pale-yellow and frothy if the liver is relaxed and the bowels are in an acid condition from sour food. Passages may be but three or four a day, thin, yet not prostrating; or they may be numerous, large, watery, and weakening.

Treatment.—Strict regulation of the diet is a first and continuous necessity, and must be imperative. All foods must be used in small quantities, and no coarse or harsh foods are allowable. Unripe fruits, green corn, string beans, cucumbers, and similar vegetables, are totally inadmissible. Blackberries, huckleberries, peaches and grapes, are usually acceptable in small quantities,—blackberries being among the desiderata in many cases, always having the sharp seeds rejected, generally best cooked. If the case linger, it may be well to try currants or tomatoes after a time, but always cautiously; and only after the bowels have been relieved of acrid materials, and the system begins to crave a mild vegetable acid. Meats generally have to be forbidden; though chicken or mutton broth is often quite acceptable, and boiled milk is especially good, but sometimes cannot be used, even by children. Beef broth often aggravates diarrhoea. Flour boiled in milk is good for young or old; so are tapioca, sage and rice, but I have a very poor opinion of arrowroot. Flour boiled in weak chicken broth is excellent. Some mothers mix flour in cold water, tie it tightly in a flat bag, and boil it four or five hours; and then grate a portion of this hardened mass into boiled milk and use it for children with excellent results. A teaspoonful of lime water to each two ounces of milk is desirable.

Cold drinks are inadmissible, though often craved. Drink and food must all be tepid or cool, never hot and never very cold. Only small quantities of fluid should be given at a time. Among the best drinks are those of mucilaginous character, as water containing a little gum arabic, or elm bark chipped and soaked in cold water, the garden or other mallows, barley water. Only a very little mucilage should be used in the water.

Acrid materials should be dislodged from the bowels by tablespoonful doses every two hours of the Neutralizing Cordial until it operates. Some prefer to unload the bowels with a goodly dose of castor oil, or spiced syrup of rhubarb. After this give a teaspoon of the Cordial every three or four hours; and every hour let the sufferer use two or three tablespoonfuls of the Spiced Tea, which may be all the fluid needed beyond the liquid forms of food. Leaves of mullein simmered in milk, with a little allspice or ginger added, make an excellent remedy to use every hour or two, giving the Neutralizing Cordial once in four hours. Children especially do well on this; and if there is such irritation of the bowels as to cause much griping, bark of cherry and a little lady slipper may be used with the mullein instead of spices. Adults, with little bowel irritation yet large stools, may use Composition tea; and add one-sixth part tincture of myrrh to each dose of the Cordial. A good preparation for such cases is a mixture of bayberry, sumac bark and ginger in equal parts, half a part prickly ash bark, made into a decoction, strained, one-tenth of a part of cooking soda added, and then made into a syrup.

It is never well to attempt to check a diarrhoea suddenly by a free use of astringents; but such articles should always be used in moderation after the bowels have been cleared by the gentle physic. Cherry bark and raspberry leaves are good astringents to use in any of the infusions. Compound Syrup of Bayberry is very fine for convalescence; keeping up the Cordial three times a day. Whenever the liver is disturbed, give half a grain to a grain of leptandrin, and two or three grains of powdered prickly-ash bark, every twelve hours.

It is proper for these patients to lie down much or all the time, for it is bad to keep about on the feet when the bowels are loose. Inclination to go to stool should be resisted as long as possible; for when the bowels are evacuated at the slightest inclination, their irritability is increased and the stools become more frequent. Use freely the Nervine Liniment over the abdomen, and follow with hot flannels, or the Spiced Bag wet in whiskey. Children, and those inclined to summer diarrhoea, should always wear a couple of thicknesses of flannel over the abdomen, or a thin Spiced Bag, bound somewhat tightly.

Chronic diarrhoea is often very obstinate. Diet and drink must be regulated very strictly, as in acute cases. A syrup of butternut bark and wahoo, with some ginger, may be used in mod-

erate doses every twenty-four hours to keep a gentle action on the liver. Before or soon after each meal give the above syrup of bayberry, sumac bark, etc.; or use the Nervine Tonic with a little golden seal added to it; and let the Spiced Tea or Composition be drank at intervals. Night and morning bathe the abdomen with a pretty strong infusion of cayenne pepper in vinegar and water, and wear the flannel bandage. Avoid fatigue, nervous weariness and exposures.

CHAPTER XLIII.

CHOLERA MORBUS.

UNDER this name are included those cases of bilious vomiting and diarrhoea which arise suddenly in hot weather. Nausea is great, (unlike cholera proper); and the materials ejected are greenish or yellowish. The stools are numerous, often griping, and the discharges yellow or brownish. Coolness and prostration are soon noticeable; and if the attack is not relieved in a few hours, the discharges become more watery; and the prostration may carry the patient into coldness, blueness, and fatal collapse.

Cholera morbus is generally provoked by the too free use of fruits and indigestible foods during hot weather; or in company with sudden changes of temperature and checked perspiration.

Treatment.—Apply a mustard draught over the stomach for a short time; and follow this with the Spiced Bag wet with hot water and renewed frequently. Give a teaspoonful or less of Neutralizing Cordial every fifteen or twenty minutes till relief has been obtained; then every hour till it has moved the bowels. Allow no cold water, but quench the thirst and assist in allaying the irritability of the stomach by giving one or two teaspoonsfuls every few minutes of very weak and tepid infusion of spearmint or catnip. A single drop of spirits of camphor in every second dose of the Cordial, is sometimes useful. If the patient get cold, use red pepper wash over the stomach, and give an injection of allspice and cinnamon in starch water every two hours; and give the Cordial in a dessertspoonful of cinnamon tea. When the attack is relieved, which will be in a few hours, give an infusion or syrup of cherry and poplar bark every three hours; and every twenty-four hours a small dose of leptandrin and golden seal.

CHAPTER XLIV.

CHOLERA INFANTUM.

WHEN, during the summer months, the heat reaches to 85° F. or above, in the shade, little children are liable to this very serious disease. It is exceedingly rare in the country; but prevails extensively in large cities, mostly attacks those in crowded quarters although none are exempt from it, and causes terrible mortality among the poor. Occuring only in the hottest portion of the year, it has come to be known as "*summer complaint*." Children under five years old are the especial sufferers. It is greatly favored by the impure air of over-crowding, insufficient or improper food, lack of cleanliness, unwholesome dampness and darkness, and the irritation of teething.

Symptoms.—These may be various in time, some beginning suddenly and showing the worst symptoms in a few hours; others advancing slowly and developing the severe symptoms only after three or four days. Simple diarrhoea,—with discharges that are thin, pale yellow, frothy, somewhat mucous, and always weakening,—are the first and principal symptoms. Soon, or at a later date, rejection of food, vomiting, pallor, and heat of the head and abdomen follow. The child looks weary and pinched, becomes apathetic, falls into a half stupor; gradually becomes comatose, the extremities are cold, shrunken, probably blue; and the child gradually dies in a stupor. Moderate fever is present from the first. Prostration of the whole nervous system is a prominent symptom throughout; and it is not unlike a diarrhoea coupled with the sunstroke or over-heat incident to the high temperature of American summers.

Treatment.—In our climate, children under five years should never be kept in a close city during the summer months, if it is possible to get them out of it. If they cannot get away for summer residence, they should at least be taken out of it on short riding or boating excursions frequently, making the distance limited so as to avoid fatigue. Open-air excursions, now generally provided for the city poor by kind hearts, are great blessings to mothers and little children; and so are city parks and public squares, when these are reasonably shaded and the children allowed to play at full liberty without a policeman to frighten them with the barbaric order "Keep off the grass." One child's life is

worth more than all the grass that ever grew in a city park ; and these public spaces should be kept for the uses of the helpless poor, rather than to please the eye of those who have means to go where they wish in summer.

Those who can go abroad, should select a high, dry, airy, and moderately shaded position ; and avoid valley, river, marshy, flat, and over-shaded places. Children should virtually "live out-of-doors," be dressed very loosely, wear a flannel roller about the abdomen, and never be allowed to sleep on feathers. Lack of attention to these particulars of locality and person, may lead to severe cholera infantum even in the country. Diet should be guarded with the utmost firmness, and none but the very lightest and plainest food allowed. "Second summer" dangers in childhood are mainly due to allowing the little child to eat of pretty much everything on the table that is set for adults ;—meat, potatoes, gravy, cake, etc. No child is capable of digesting such food in the summer months, especially while teething. Potatoes are very bad, though not usually so considered ; and so are corn, beans, and other harsh fruits. Let young children have plenty of *pure* milk, dilute it a trifle with water if it is really very rich (Alderney or Jersey cow's milk), and put a dessertspoonful of lime water to each six or eight ounces. *Fresh* milk should constitute a large portion of children's diet in summer ; and some bread, berries, and a little real plain sponge-cake, added. All this by way of preventing cholera infantum ; and of checking and remedying it should it appear. Medication is of little consequence, unless these hygienic rules are observed. And little children should have a light and quick sponge-bath of cool (never real cold) water every day in hot weather, unless the day get suddenly cool in the heated term ; and then the bath should be decidedly warm. And mothers who are nursing should take every possible precaution against their own over-heating, eating freely of coarse vegetables, and otherwise disturbing the system.

Even a slight summer diarrhoea in a child should be met promptly. I am partial to half teaspoonful doses of Neutralizing Cordial in a tablespoonful of cherry-bark infusion, given every three hours. Always add lime-water to the milk ; and generally it is best to boil the milk, for it begins to change in a few hours in summer, and half-sour milk is disastrous to these children. The boiled flour, mentioned under Diarrhoea, is often the most acceptable of all foods. Some of the prepared foods, especially Nestle's,

Murdock's, and the Imperial Granum, are suitable to most children; but should be used in quite moderate quantities, best after the acute attack has subsided, and changes are not to be made from one to another of these unless the one in use seems distinctly to disagree with the child.

If the feet are cool, bathe them every six hours in warm water and put on comfortable hose. If the body and head are hot, sponge every two or three hours with fully tepid (never with cold) water, and dry very lightly. Move the child about as little as possible, keeping it very quiet and gently fanned. Apply the Spiced Bag to the abdomen, wetting it at intervals with hot water. For the child's thirst, give moderately cold water in small quantities; or tie a small piece of ice in a thick rag and allow it to be sucked frequently. Nervine Liniment, diluted with once or twice its bulk of water, is useful to the spine every eight or twelve hours. Injections of thin starch water made on a weak infusion of raspberry leaves, or of cherry bark, with one-third of an even tea-spoonful of powdered lady slipper in each, are valuable, and may be repeated every four hours and retained by a compress. Weak infusion of raspberry or cherry bark may also be used as a drink, instead of water.

If the case is protracted, the fever and stupor passing off but weakness and half involuntary discharges continuing, use a stronger infusion of cherry bark with a little poplar bark and flavor of allspice. Continue the Spiced Bag and care in the diet, omit baths except to keep the extremities warm.

CHAPTER XLV.

DYSENTERY. FLUX. BLOODY FLUX.

DYSENTERY is also called *Bloody Flux*, because of the nearly constant presence of some blood in the stools. It is an inflammation of the lower and large bowel; and differs from diarrhoea in having fever, small stools that are mucous and bloody, and are passed with gripping and protracted straining efforts. It is most common in summer, usually provoked by circumstances similar to those which cause diarrhoea, in some years is violently epidemic; and is always very severe when it appears in camps, tenement

houses and other crowded places. It is frequently of malarial origin.

Symptoms.—Most cases begin with increased and griping stools, with some relief after the small discharges; these increasing to from six to twenty or more in a day, chiefly of transparent mucus, occasionally mingled with hard faeces, presently streaked or dotted with blood, and of a peculiar smell. Mild fever arises, the tongue is furred and moist, the stools are voided with much straining, shreds and patches of membrane presently appear in them, the amount of blood increases, and there is much loss of strength. In from six to ten days the severe symptoms subside and slow recovery follows.

But severe cases begin suddenly, and soon all the symptoms are violent and the patients strength is much prostrated. Blood is more abundant and quite dark, stools close together, straining urgent and prolonged, shreds numerous and large. If the liver is deranged, the tongue will become heavily furred, yellow, and dry; urine scanty and yellow; fever high, perhaps with headache and even some night delirium; and the stomach may be distressed and vomiting occur. A cold and pale surface, clammy perspiration, and pinched features, occur in extremely dangerous cases. In foul and crowded quarters, and also in malarial districts, dysentery may give dangerous typhoid symptoms, such as brown and dry tongue, black and foetid stools, small pulse, and alarming prostration. When epidemic, it is generally very severe.

Average cases are easily managed and will recover promptly. Severe forms are highly dangerous, may be accompanied or followed by ulceration in the bowels with pus in the stools, and provoked to sudden returns by indiscretions during convalescence.

Treatment.—In every case, the patient must keep off his feet if he wish early recovery; and this is imperative in the simplest dysentery. Resist the inclination to stool to the utmost verge of endurance, and also the tendency to strain, and thereby reduce the inflammation. It is astonishing how long one can refrain from having a passage in dysentery, after farther restraint was felt to be impossible. Allow no ice, iced drinks, or liquors of any kind, no matter how earnestly craved; and permit only mucilaginous drinks in small quantities, such as gum arabic, elm, or mallows in water. Only the blandest food is to be allowed, as thickened milk, softened crackers, toast, mutton or chicken broth, etc.

Unload all harsh materials from the bowels by a couple table-

· spoonfuls of Neutralizing Cordial, repeated in four hours if the first does not seem to act as a physic. Then give a teaspoonful of this every three or four hours. Give a small injection of starch water, or of elm powder stirred in lukewarm water, with an even teaspoonful or less of powdered lady slipper; insist on having it retained, and repeat every three or four hours. Injections are best given right after a stool; and if the stools are delayed several hours, delay the injections accordingly. Bathe the whole abdomen with Nervine Liniment, or with red pepper in boiling water and vinegar, every six or four hours. Bad cases need the pepper application strong and hot; and it is of great value, far better than mustard. Always put several layers of hot flannel over the abdomen after applying the wash or liniment; and keep to it a moderately hot brick, jug of hot water, hot water bottle, or similar warmth.

For feverishness, a lukewarm infusion of catnip, or balm, or white root, with a little anise seed, is all that is needed. Never give for dysentery anything stimulating, as Composition, the spices, bayberry, or articles of that class; which are admirable for a diarrhoea, but are out of place altogether in this inflammation.

After moving the bowels with the Neutralizing Cordial, or else with a suitable dose of powdered magnesia, give every twelve hours a small dose of leptandrin with two or three grains of powdered rhubarb, to keep the liver in gentle action. In bilious cases, give a larger dose of leptandrin with two or more grains of golden seal; and this every twelve hours till the bile become free and healthy, though the first passages of bile cause much suffering to the inflamed surfaces. Some obstinate bilious cases will not yield till a pretty vigorous emetic of the nervine class has been given. In other respects, pursue the treatment as above. If the surface get cold and pale, use no catnip or other tea suitable for fever; but bathe the entire trunk and limbs with the strong and hot pepper wash, wrap the limbs in hot flannels, and put heated bricks or water jugs along the trunk and extremities. Cover the patient snugly, and insist on his stillness. Alarming cases yield to this strong outward stimulation.

After the liver gets into action and the fever subsides, mild and astringing tonics may be given; but it would be a mistake to give such remedies before, or attempt to cure dysentery by astrin-gents. Now the patient is in a fair way to convalesce, and needs gentle strengthening. An infusion or syrup made of two parts cherry bark and one part poplar bark, may be used every three

hours. If the prostration is considerable, or the region is malarial, add one part Peruvian bark. Use stimulation over the abdomen night and morning while any uneasiness lasts; and give a small dose of leptandrin with golden seal every twenty-four hours. Food of plain and light quality must be adhered to for a considerable time, and caution be used in returning to business too soon for the weakened bowels cannot easily endure the erect position. Indulgence in iced articles, liquors, or even the too free use of ripe and sweet fruits, will endanger a return of the trouble.

CHAPTER XLVI.

CHOLERA. ASIATIC CHOLERA.

THIS disease uniformly starts in India, from whence it spreads in different directions along the lines of travel and of commercial communication. It is nearly constant there; but at various intervals becomes aggravated and then extends, generally passing northward and westward around the entire globe in from two to three years. Its true cause is unknown; but it is promoted by human crowding of filth and decay of animal matter in the sun, and is extended by intercourse without regard to distances. It is communicable only as matters discharged from choleraic patients find ingress to the body of others. In 1854, Dr. Snow, of England, proved "that if by leakage, soakage from cesspools or drains, or through reckless casting out of slops and wash-water, any taint (however small) of the infective material gets access to wells and other sources of drinking water, it imparts to enormous volumes of water the power of propagating the disease."

Persons attending these patients run no risk whatever, except as they may swallow the poison as passed from the bowels and that finds access to drinking water, or rises in the dried state in ill-ventilated rooms and is thus swallowed. It is not contagious by the odor, as are small-pox and other eruptive diseases; nor by any handling of the sick if every vestige of the stools is removed and destroyed so it cannot be swallowed by any mischance. It commonly ceases in a locality in cold weather, but may break out again the next spring. Persons living in

low, damp, crowded and filthy districts suffer most severely in all cholera epidemics; and those indulging in coarse food, or alcoholic or malt drinks are much the most sure to die if attacked, and these are the subjects most numerously attacked.

Symptoms.—Many begin suddenly with violent vomiting and purging; many others begin suddenly with thin diarrhoeal stools, some nausea, no vomiting, slight pain through the bowels, prostration, and a peculiar feeling of exhaustion at the pit of the stomach. Stools may be few or many in twenty-four hours, and gradually become copious. If not stopped in this first stage, the second stage will develop in from a few hours to two or three days. In this second stage the stools are large, watery, frequent, and give a feeling of relief. They look like water in which a little rice has been boiled, and are in reality the fluid and saline portions of the blood that pours out of the blood vessels into the bowels. Vomiting quickly follows, first of food and mucus, soon of water and some mucus. It is violent and rapidly increases the prostration. Thirst of the most intense kind sets in, with burning heat at the pit of the stomach, terrible restlessness, rapid and weak pulse, hurried breathing, cold surface, though a feeling of burning heat is loudly complained of, and excruciating cramp in the bowels and extremities. The patient tosses wildly about, throws off all bed-clothing, begs for water, pleads for some one to rub the limbs and thus to relieve the spasms that are drawing the muscles into rough and hard knots. A husky voice, pinched features, doughy skin, wrinkled and purplish hands and feet, accompany these symptoms, which may continue any time from two to twelve or fifteen hours. So long as there is a pulse to be felt at the wrist there may be hope.

The third stage is that of collapse, in which cramps continue, a clammy perspiration breaks out, purging and vomiting continue but are less severe, the eyes are sunken deeply, breathing is very rapid and the voice a mere whisper, a bluish-purple hue spreads over the face and body, the surface is exceedingly cold, the urine suppressed and the pulse at the wrist ceases. Some die in this stage at once; others continue in it several hours, sinking steadily, with the mind perfectly clear to the last moment but totally indifferent to all earthly concerns or to death.

About thirty-five per cent. may recover from the collapsed stage after lying in it from one to twenty-four or more hours. In some who die, purging and vomiting cease, the pulse may return,

but respiration continues greatly hurried, the patient lies still with the eyes half open, urine continues suppressed, and the cold perspiration fairly bathes the surface. Those who recover from the collapse show a gradual rise of surface warmth, slower and more natural breathing, a quiet sleep, return of the urine after twenty-four to thirty-six hours, and then gradual restoration through a period of great feebleness. Recovery may even yet be hindered by continued suppression of urine, inflammation of stomach or bowels, congestion of the lungs, heart clots, bleeding from the bowels, and other complications in feeble or half-starved subjects.

Treatment.—Unreasonable fear at the approach of a cholera epidemic, or in its presence, is damaging. Fright cannot cause the disease; but will put the system in a state to invite an attack, and to make that attack more severe if it come. A malady that so rapidly prostrates the body and disintegrates the blood, can best be resisted and overcome by those in sound health, good nerve, and undepressed circulation. It is a grave malady; yet only a certain portion of the attacked ever die, and these deaths are but few among the healthy, well nourished, calm tempered, plain living, and strictly tee-total abstainers from drink. A panic at such a time is a sad matter.

It is also desirable to make one's diet simple and regular, and to use temperately of all suitable vegetables and fruits that are *ripe* and *fresh*. There is a deep public belief that such foods are objectionable. On the contrary, they are very desirable in cholera times, and may be used to advantage in moderation. Danger lies in eating unripe and stale products that would be a serious tax upon the stomach and bowels under any circumstances; and indulging in these with fool-hardy gormandizing. Fearful consequences attach to such folly; and also to every form of personal dissipation, revelry, and hygienic neglect.

In city, town, and country, the utmost purification and disinfection of premises must be practiced, as directed in another chapter. Mere dirt without animal decay will not cause cholera; but local filth-influences weaken the resistive powers of the system, and foul and crowded towns and tenements suffer most frightfully during this disease. Disinfection and purification should reach to every nook and corner, to every vault, cellar, drain and gutter, that nothing be left to decay and there pollute the atmosphere, nor be turned up to the sun and then left to decompose the more rapidly. Special quarantine is usually resorted to for its

prevention, but the history of the spread of this disease offers no encouragement to this measure, and nothing is more definitely established than the fact that the most vigorous quarantine has never yet arrested the extension of cholera. Local sanitation, and especially the speedy removal and disinfection of all decaying animal matter, are the great and effective means for its prevention. To be at all effective, these should be attended to weeks before the malady appears, and not left until the scourge announces its actual presence in a neighborhood.

As there is such abundant evidence that the germs of cholera, in whatever form they may be, are oftenest conveyed through drinking water, it is not possible to be too rigid in refusing to use water that is suspected. This is a time when spring water from *deep* springs, or rain water from good cisterns, is altogether advisable for drinking purposes. Where this can be obtained, it should always be used; where it cannot be procured, then the well or hydrant water should be passed through the best obtainable filter, and be thoroughly boiled, before being used, and these precautions should be followed without regard to the clearness or *seeming* purity of the water.

Some quarters of a town or city, some particular houses, have suffered severely in previous epidemics. These are in low, damp, crowded, insalubrious places occupied by the poor. Such places are strong harbors for the disease, and are sure to develop it and give a high death-rate at the next visitation. It would be a blessing to all if, at an epidemic, the poor in those localities could be induced to leave them and find protection in higher and more open places provided by public authority. Every consideration of personal and public safety commends this as the most secure step possible.

During the early diarrhoea, give a moderately strong infusion of equal parts lady slipper, dioscorea, ginger and witch-hazel, a tablespoonful or less every half hour to fifteen minutes. Small and frequent doses are always best in this disease. Every three hours a teaspoonful of Neutralizing Cordial and five to ten drops myrrh tincture. Over the abdomen apply the Nervine Liniment freely every two hours, followed by a few thicknesses of heated flannel, and then a jug of hot water to the abdomen and another at the feet. Keep the patient strictly in bed, quiet, well covered; and allow a very small piece of ice to be dissolved in the mouth

frequently, deny all water except a teaspoonful at intervals, give no food.

When violent purging and vomiting set in, use stronger medicines. Put Stimulating Liniment over the abdomen; and lay on layers of flannel wrung out of very hot water with a little soap, and renew these every few minutes. Rub the extremities every hour or half hour with hot salt and water containing cayenne; and follow with nearly constant hand rubbing when the extremities cramp. Put jugs of hot water at the feet and all along the sides, and do not remove the clothing while rubbing the patient. Give any one of the following preparations every ten to twenty minutes :

(1) Golden seal one part, Composition powder three parts, made into a moderately strong infusion. Dose, two to four teaspoonsfuls. (2) Composition four parts, scullcap and blue cohosh each one part. (3) Common smartweed two parts; golden seal, ginger and bayberry each one part. To half a pint of a fair infusion of this add a teaspoonful of compound myrrh tincture. Two or three tablespoonfuls of good vinegar may be added to any one of these preparations; and usually this is of great benefit. One to two drops spirits of camphor added to every second or third dose, often enable the stomach to retain the medicine.

A valuable preparation may be made by tincturing in a quart of good vinegar a pound of the mixed articles named in No. 3, as above, adding half a part each of scullcap and gum kino. After steeping for a week, press out firmly and strain through a fine cloth. Then add to a pint of this tincture one ounce compound tincture myrrh and two pounds granulated sugar, stirring till the sugar is dissolved. This may be given in doses of a teaspoonful or more.

When quietude begins to return, let the patient rest; keep gentle warmth upon the surface; and urge no food, medicine or drink for twelve or twenty-four hours. Nurse him carefully back to convalescence.

CHAPTER XLVII.

FALLING OF THE BOWEL. PROLAPSUS.

WHEN the muscles of the rectum are weak and relaxed, and its lining (mucous) membrane in a similar state, loose folds of this membrane are liable to be forced out of the anus during stool. Sometimes the muscular walls themselves are protruded. Children are most subject to these accidents, summer diarrhoea and its associated feebleness greatly favoring this "falling of the bowel." But adults and elderly people may suffer thus; and are the more liable to it if habitual constipation have hardened the faeces and made straining efforts at stool necessary. It may occur with or without piles.

From one to five or six inches of the bowel may be protruded. When the protrusion is short, it forms a rounded swelling overlapping the anus, contracted at the neck, with the small round opening of the intestine in the centre. Protrusion of a longer portion gives a rather pear-shaped tumor tilted somewhat forward or to one side. The surface may look florid, or livid violet from the constriction of the blood-vessels above. By prolonged repetition in adults, the mucous membrane becomes greatly thickened, and also the muscular walls of the bowel when these are involved in the prolapse; which may make return of the bowel troublesome, and by mere bulk incite to forcible protrusion when returned.

Treatment.—Diarrhoea and irritability of the bowels must be checked in children, constipation steadily relieved in adults, and the secretion of the liver put in good condition. It will also be best always to lie upon the back during stool, using the bed-pan and exerting the least possible force. Return the bowel at once, first covering the surface of the protruded part liberally with an ointment of powdered kino, tannin, oak bark, or other strong astringent. Gentle and steady upward pressure on the tumor, with the fingers partly encircling it,—the person lying on his back with the knees lifted up,—will restore the protruded part. Sometimes it is inclined to be pressed out again so quickly that a compress to the anus has to be worn for a time to retain it.

CHAPTER XLVIII.

FISSURE OF THE ANUS.

NOT unfrequently, while straining forcibly to expel fæces that have become hard, persons will slightly tear the membrane at the edge of the anus. It is an accident at once noted by the patient, and generally followed by a little fresh blood. It is sometimes healed up spontaneously; but is also liable to subsequent recurrence, and then falls into a condition where there is no process of healing attempted, but the little sore remains for years. With each stool it causes a stinging, burning, smarting sensation, and probably the loss of a little blood and the discharge of a very little pus. In a short time after the stool—varying from a few minutes to an hour or more—there begins at the anus a dull, aching, gnawing, throbbing pain, that is constant, tormenting, and almost unbearable. Its continuance varies from one or two hours, to ten or twenty hours; and then it ceases entirely but returns with the next movement of the bowels, thus causing the sufferer to delay his stools and add to the laceration by so doing. By this suffering and the irregularity in the alvine movements, such persons become gravely disordered in the nervous system, fall into impaired digestion, and lose greatly in general health. The size of the fissure or ulcer that causes all this distress, is small and even insignificant.

Treatment.—An ointment of golden seal, or of witch-hazel, in lard, is often effectual. Let the bowels be moved regularly; and the anus gently stretched and the ointment applied freely right after the stool. Some cases will not yield to anything short of a surgical operation, which is not dangerous and always sure.

It is always advisable to sustain each side of the anus at stool by suitable pressure with the thumb and fingers. As most of these fissures occur at the posterior edge of the bowel, such support can usually be given effectually and greatly limit the danger of lacerating the gap each time. A hot and brief sitz-bath will generally relieve the throbbing pain.

It is always advisable to keep the stools plastic, or even thin, by the pretty free use of fruits and vegetables, and by the occasional use of Rochelle salts or other physic that promotes thin passages.

CHAPTER XLIX.

PILES. HÆMORRHOIDS.

THESE are tumors about the anus, or an inch or two within the rectum, seldom met with till after middle life, occurring somewhat oftener in women than men. When situated upon the edge of the anus, or within half an inch of the edge, they are said to be *external*; when higher up in the bowel and out of sight unless forcibly protruded, they are called *internal*.

External piles may consist of one tumor, or of two or more; varying in size from a pea to a walnut or larger. They often become inflamed, and then are exceedingly tender and painful; become hot, tense and purple; swell, cause much discomfort in walking and sitting, and force the patient to bed with distress and fever. Such an attack of inflammation lasts several days, is inclined to recur, and causes enlargement of the tumor. The swollen part may burst, discharge blood, and then shrivel to a tab of skin that causes no more trouble; or it may increase as the years go by, become hard, and cause great inconvenience. Many times these growths incline to suppurate, and to form fistulæ.

Internal piles grow slowly and attain considerable size, but seldom inflame or cause much acute suffering. But their structure is often loose and spongy, and inclines to such frequent losses of blood as to be called "bleeding" piles. By such losses the patient is constantly reduced; and sometimes the hemorrhage is great enough to endanger life. After years of growth, the tumors begin to be extruded during straining efforts at stool, carrying the lower end of the bowel with them in prolapsus, appearing outwardly as purple and strangulated masses, irregular in shape, covered with mucus, oozing blood. When such expulsion takes place, it gives a sensation of fæces in the bowel and may thus cause the patient to continue injurious straining efforts. At first, the mass is drawn within the anus and slips up into the bowel when the patient rises from stool; but by repeated protrusions the parts become so weakened that they do not return spontaneously but only by much careful manipulation.

Constipation is probably the most general cause of piles; and the suffering induced by a stool when piles are present usually leads to irregularity in going to stool, thus increasing the constipation. Among other common causes are, neglect in answering

the calls of nature, forcible efforts to empty the bowel of hard faeces, distended intestinal veins from congestion of the liver, pressure on the bowel by pregnancy, ovarian tumor, etc. Sedentary pursuits requiring a person either to sit or stand much of the time, frequently cause piles; and they are among the common ailments of civilization. They are always very distressing, and in most persons cause general disturbances of the nervous system, indigestion, loss of flesh, and a sense of perpetual wretchedness, sometimes almost seeming to undermine the constitution.

Treatment.—Prevent if possible, and mitigate always, by keeping the bowels regular, as directed under the head of Constipation. Resort to physic seldom; and never use aloes, nor over-doses of any harsh cathartic whatever, which often cause piles and always aggravate them. Butternut-bark with a moderate portion of wahoo is the best physic for these troubles; and chewing a tea-spoonful or two of flaxseed each day, or some elm bark, will be advantageous. Some of the saline waters that are slightly purgative may be used in moderation; and such articles as solomon seal and comfrey made into a syrup with yellow dock, may be used with benefit after each meal. Injections cause much distress, and cannot often be used; but a suppository of lady slipper and a little lobelia in powdered elm and a little softened tallow, may be inserted well into the bowel at bedtime to prepare it for an evacuation the next morning by softening and lubricating the parts. Before the morning stool, if possible give an injection of from four to six ounces of water as cold as will comfortably be borne, and retain it about half an hour. By this course the evacuations are usually softened and pass easily, and prolapse of the tumors and bowel is prevented.

In an attack of inflammation, the patient must lie down, with the hips rather elevated and the head low. Move the bowels with a dose of castor oil or Rochelle salts, and keep them well moved each day. Apply upon the tumors an ointment of lobelia seeds, and then a poultice of ground flaxseed,—or of ground elm with some lard or sweet oil mixed in it. Change the poultice every few hours. Two or three days usually break the attack; and the remaining tenderness may then be relieved with an ointment of powdered beth root or witch-hazle leaves in lard.

When internal piles extrude through the anus, they must be returned at once and carefully. It is well to cover them first with lard or oil, or with the beth root or witch-hazle ointment. If their

return is difficult because of strangulation, the patient may take a hot hip bath, or sit over the steam from camomile or peach leaves, and then return them. If piles bleed much, an astringent ointment should be used liberally during the day, such as of beth root, witch-hazle, wild geranium, or oakbark. For the peculiar soreness present, the first two articles are admirable. A very serviceable oil may be obtained by cooking the yolks of eggs in an iron kettle till an oil appears, stirring all the time; then expressing this oil through a piece of muslin, and using it alone (tinctured a little with the iron from the vessel) or adding some beth root. Pass such ointments high into the bowel with the finger.

Daily perseverance is necessary for even moderate comfort. Finally the tumors get so large that they cannot be returned without great suffering, or cannot be returned at all. In this condition, it is advisable to have a surgeon remove them by an operation. Small tumors (external) may be destroyed by frequently touching with nitric acid; but this plan is not without danger, and will not answer at all for internal piles. Radical removal of these by operation is the only effectual plan at the last. Modern methods have made it less painful than formerly, and it is without danger. I have removed several scores of such tumors, some of them as large as great tomatoes, and never had an accident; and they do not return when thus removed, but leave the patient completely relieved and with the general health at once improved to a surprising degree.

CHAPTER L.

DISEASES OF THE LIVER.

As the largest organ in the body, the liver plays an important part in health and a very significant one in disease. Its disturbances are quite varied, afflicting all ages and conditions, appearing with prominence over large areas of country, and showing themselves so frequently as to impress many people with the idea that if one can but keep the liver in proper condition his good health is assured.

The chief bulk of the organ lies in the right side, the lower edge about on a line with the edge of the ribs and extending up-

ward to the line of the ninth rib. A smaller portion or lobe extends across the stomach and above it to the edge of the tenth rib on the left side. The gall-bladder, with the large gall-ducts, lies under the lower edge of the right side at the front end of the tenth rib.

Different purposes are served by the liver. Chief among these is the preparation of bile, which is formed from the venous blood,—nearly all of this blood from the center and lower body passing through the liver on the way to the heart. Bile is being formed slowly all the time, but most rapidly while digestion is going on; the amount commonly made by an adult ranging from $2\frac{1}{2}$ to 3 pounds in twenty-four hours. It passes through the small tubes of the organ and accumulates in the gall-bladder, where it is held in reserve till the presence of food and the process of digestion call for its discharge. When discharged into the duodenum, it aids in the process of digestion there and also in the small bowels; and this intestinal digestion cannot be completed properly without a supply of good bile(p. 125). It promotes the necessary changes in starchy and saccharine foods, and the appropriation of fats. It also stimulates the muscles of the bowels to action, and is needed to maintain healthy movements and to prevent constipation.

Allied closely with the stomach and its function, derangement of either organ involves the other, hence liver troubles and indigestions are commonly met in company. Failure to secrete the bile leaves in the blood a number of elements that should be removed; and their slow accumulation gradually poisons the blood. If bile is secreted and then not cast out from the tubes and the gall-bladder, it will be resorbed into the blood and prove poisonous. Such poisoning in limited degree exists in the numerous cases of "biliaryness," causing thickening and sallowness of the skin, yellow fur upon the tongue, loss of appetite, bitter taste in the mouth, scanty and red-brown urine, constipation and dizziness. When more severe, the skin and eye-balls become yellow, the digestive and muscular systems are prostrated, heaviness of body and mind ensues, with unnatural sleepiness, melancholy, and other marks of depression. Eruptions of different kinds are often caused by liver troubles and poisoning with bile.

The functions of the liver and its associated organs are overdone and slowly exhausted by the use of rich foods in abundance, spices, malt and alcoholic drinks, and general high living; also by habits of indolence with insufficient muscular exertion, and by hot

weather. He who would maintain a healthy liver, or restore one that is diseased, must rigidly curtail his diet and eat none but simple foods cooked in plain forms, avoid fats and spices, eat moderately of even the most appropriate foods, totally abstain from wine, beer, and all other alcoholic drinks, and take good exercise every day,—rising early. Walking and horseback exercises are excellent.

The southern latitudes always increase these troubles, but even there a proper regulation of one's personal habits will greatly mitigate these diseases. It is the misfortune of most of these sufferers that they have or cultivate a constitutional fondness for rich diet and fatty modes of cookery; and that they are disposed to insist that their living is plain because less rich than their former standard, when other people know that it is still much too greasy and stimulating for good health. And these sufferers also incline to indolent habits, partly because the depressing effects of bile poisoning make exertion troublesome, partly because they may become obese and heavy. But despite these adverse facts, those who are in danger of liver diseases *must* put aside their taste and inclination, and *force* themselves to a system of plain dietary, total abstinence, and regular muscular exertion in full quantity. By beginning this course in good time, and enforcing it upon themselves rigidly and constantly, they will check and suppress the dangers of this class of maladies for many long years.

CHAPTER LI.

CONGESTION OF THE LIVER.

IN some of its various degrees, this is the most common of the liver troubles, and with bilious-lymphatic temperaments appears to be almost constant. It is frequently called *Torpidity of the Liver*, and results from a large variety of causes, chief among which are the following:

(1) Eating and drinking beyond what the stomach is capable of digesting easily; and this though the food be plain in character yet too hearty in quality, the influence being worse when the hot condiments are used and alcoholic drinks indulged in. During digestion, there is always an increased flow of blood to the liver;

but when excesses are practiced, and the organs stimulated beyond a healthy degree by rich and irritating foods, the blood-vessels are distended to an unusual degree and their enlargement becomes continuous. Sedentary and indolent habits, or lack of muscular exertion suitable to the person, will increase the dangers from this source.

(2) Exposures to excessive heat in tropical or sub-tropical climates; which cause is operative in the southern sections of our country. In the central and northern sections, the high heat of American summers favors weakness and enlargement of the liver; and this is aided by great heartiness in eating among farmers and other laboring men, who thus become afflicted with torpid and congested liver. Temperance and regularity in food and drink greatly diminish the influence of heat.

(3) Long exposure to malaria, even without attacks of pronounced ague, gradually enlarges the liver and its veins and establishes congestion.

(4) It often occurs in connection with typhus fever, scurvy, and the eruptive fevers. Sometimes it is the result of direct violence over the organ.

(5) In women of full blood and redundant flesh, who are approaching the "turn of life," it occurs frequently; increases as the menses are suppressed, and may continue long after their cessation. It may appear in other cases of menstrual suppression in earlier life.

(6) Diseases of the heart and large arteries, and some chronic diseases of the lungs and in the chest, may obstruct the flow of blood from the liver and cause its pronounced congestion.

Symptoms.—According to the degree of enlargement in the vessels, and the duration of the case, the symptoms will vary. In acute cases, there is some general disturbance of the system, with a furred tongue, sallowness, sense of fullness and oppression in the right side along the ribs and in the stomach, nausea, sometimes bilious vomiting, constipation probably followed by bilious diarrhoea, increased uneasiness from pressure of the clothing or by lying on the left side, dizziness, headache in the front and temples, and flatulence of the bowels. Such symptoms are not always severe and usually continue but a few days, causing loss of appetite and considerable nervous irritability.

In the more chronic cases, all the above symptoms are present and are more severe. Headache is persistent, almost constant,

constipation, with dry and dark (or clay-colored) stools is the rule, interrupted at times with brief diarrhea. Dyspepsia with flatulence, fullness and weight in the right side, occasional pains under the right shoulder blade, scanty and red urine that often deposits a brick-dust sediment in the vessel, muscular aching in the back and limbs, flushings of the face and cold extremities, slow pulse, marked depression of spirits and growing melancholy, drowsiness, heavy sleep that is unrefreshing, languid and fatigued feelings in the morning with bitter clamminess in the mouth,—these are the common symptoms, and continue for weeks or months. In severe cases that are protracted (especially under tropical or malarial influences), the sallowness becomes pronounced, even giving a bronzed appearance to some; the circulation becomes irregular, the headache oppressive, the skin dry and rough, mental depression constant except when alternated with irritability, and there is decided disinclination to exertion of any kind. In all cases, of whatever grade, the liver is enlarged and gradually hardened,—extending quite below the ribs, and upward under them well toward the nipple. And these persons are quite susceptible to changes of temperature, feeling chilly and even cold on slight provocation.

In some mild yet protracted cases, and more so in severe cases, a general appearance of pallor underlies the sallowness, the cheeks and lips are without color, and the patient furnishes many of the peculiar symptoms described under Anæmia. In fleshy women, palpitations are common; and so are nervous excitability, feelings of apprehension, and similar nervous disturbances,—the mental depressions getting the common title of "hypo," and sometimes laying the foundation of protracted and alarming melancholia. Dropsy not unfrequently has its origin in liver congestion. Promoted by rich food, it often leads to slow changes in the liver, such as fatty degeneration.

All these symptoms are not uniform, though all are more or less common. Persons may endure them for a long series of years, with times of remission and other times of exacerbation, and not seem to lose in flesh; while many others become emaciated and die prematurely. It is at all times a distressing malady.

Treatment.—Acute attacks terminate soon under absolute rest and quiet; restriction to a bland and fluid diet; and a goodly dose of euonymin or of liver pills, followed by seltzer aperient or Rochelle salts. Or the anti-bilious physic with cream-of-tartar

may be given, and a smaller dose repeated in four hours if necessary. Following the attack, use a plain and limited diet, and a liver pill each night for a time. An acute attack may be provoked easily in those already suffering a mild degree of chronic congestion, and then the bilious vomiting is likely to be distressing and to recur frequently.

In chronic cases, the rigid course of temperance in drink and diet elsewhere mentioned, must be followed steadily. Fresh meats, game and fish are to be used in such moderate quantities as the occupation of the person demands; coffee should not be used at all, neither should pastry or cakes; fruits and vegetables should be used freely as part of the meals; and gravies and fatty modes of cookery are at once to be interdicted. Daily muscular exertion, actual *work*, must also be insisted on with the sedentary; but many hard laborers are troubled with this congestion, and these should moderate their toil, especially not making it active for a half hour or more after eating.

Keep the liver in very gentle yet regular action by suitable remedies that have a tonic effect. Compound Gentian Syrup is suitable, taken in small doses half an hour after each meal. With some persons the syrup form is not acceptable to the stomach, on account of the sugar; and then an infusion may be used, as of two parts boneset, one part wahoo, and one-tenth part bitter root, with a little essence of peppermint for the flatulence. Making such an infusion of a large teaspoonful of the combined powders to a teacup of boiling water, half an ounce of glycerine may be added as a preservative. Preparations of moderate strength and in small doses, are better than the huge doses to which some resort. Some persons prefer a pill or capsule to the fluid forms of medicine; and these may take one grain of scutellarin and half a grain of euonymin in a capsule; or make these into a pill with some stiff extract of boneset, and use one after the noon meal, or after each meal if necessary.

For the constipation, use at bedtime a full dose of the Butternut Syrup; or take one or two Liver Pills; or one grain of euonymin and one-fourth grain podophyllin. The dose must not be such as to purge, but just enough to promote a fair action the following morning. Each person soon learns how much he will need to accomplish this; and then should be careful not to be tempted into any repetition of active physicing, though the sudden accession of an acute attack will make purging necessary. Fleshy patients of

this class do well on the use of any gentle saline and aperient water in the morning. Among such waters are the Carlsbad, Marienbad and Selters of Europe; and in America, Harrodsburg and Crab Orchard of Kentucky, Saratoga (Union and Hawthorn). All such waters are to be used only during the warm months and by fleshy people; and their long-continued employment, or drinking them to excess, is never advisable. Sulphur waters are often of much service, and more so when the blood is thin, the patient spare in build and pallid. Probably the very best of all mineral waters, whether American or foreign, is the Winona well of Lockland-Wyoming, Ohio. It combines the sulphur and saline properties, (which is very desirable), is gentle and partially tonic in action, and can be used freely by all classes,—being especially desirable in liver congestion from malarial and menstrual sources.

Where these waters cannot be obtained conveniently, fleshy people may occasionally take a morning draft of Tarrant's Seltzer Aperient, or a seidlitz powder, or a small dose of Rochelle salts; but such articles are not to be depended on or repeated often. A good laxative to use occasionally in the morning is made of one-fourth ounce Glauber's salts and half an ounce syrup of rhubarb, given in water with a few drops essence of peppermint.

Sometimes the stomach is so nauseated, or vomitting is so easily aroused, that it is best to avoid medicine as much as possible. In such instances I have long been in the habit of spreading the extract of wahoo as a plaster and laying it over the liver and along the upper line of the stomach. This can be worn four or six hours a day, usually during the afternoon, and will promote a fair and steady action of this organ. By wetting it with equal parts of water and alcohol, the drying extract will soften in an hour or two, and the same plaster may be used three or four days. A small effervescent draught once or twice a day will generally relieve the vomiting, which may be only in the morning or the evening; and doses of the hyposulphite of soda solution often will do the same.

Persons of this class usually desire acids, and should be allowed them with some liberality. Pickles, vinegar, lemonade or clear lemon juice, and acid fruits, may be used as desired, yet should not be crowded upon the system. Buttermilk and whey are in the same manner advisable, while sweet milk is generally unacceptable or positively objectionable to most "biliary" people.

When these patients reside in malarial districts and begin to

fail in constitution and look bloodless, the headache probably being almost constant, there is no alternative but for them to remove to a different section and there for many months pursue an invigorating course of management. Menstrual derangements causing liver congestion, are treated of in my WOMAN'S BOOK OF HEALTH.

CHAPTER LII.

JAUNDICE.

UNDER this title is included a condition of yellowness of the skin and eyes, due to the presence of bile; and of changes in the urine, sweat, and other secretions from bile unnaturally secreted by the respective organs, because of its not being cast out by the proper channels. It is a general symptom due to a variety of conditions, and coming up in various diseases of the liver, among which are gall-stones, hardened bile, or other obstructious of the ducts; shrinking or atrophy of the liver; torpor and congestion; blood-poisoning depressing the liver (as in yellow fever, malarial fevers, animal poisons); cancer and other tumors; failure of passage through the bowels from disease of the duodenum, prolonged constipation, etc. Most of these causes are sufficiently discussed and treated in other chapters, and I design in this place only to give some other and general facts relating to jaundice.

Symptoms.—This is itself but a symptom, yet has a general history in all cases. Its most prominent evidence is a yellow tinge over the whites of the eyes, spreading from the corners toward the centers; then yellowness across the temples and other exposed parts of the skin, steadily spreading until the entire surface to the very fingers and toes has a distinct yellow cast. This color varies from a pale sulphur or lemon yellow, through a citron yellow, to a deep olive or bronzed hue that at times is so dark as to get the name of "black jaundice." In obstructed ducts and chronic cases, this color is usually deepest; in more recent cases is lighter, and often varies from day to day. It is also deeper in old and wrinkled people than in the young and fair; and may remain in the skin for some time after the condition of the liver has been corrected.

The urine becomes scanty, and is laden with bile that colors it

saffron-yellow, reddish-brown, or almost brownish-black. Yellowness of urine may appear before the changes on the skin. Digestion is much deranged; the tongue is yellow and has a bitter taste; the bowels are constipated, the passages small and of a drab or clay color from the absence of bile, with an occasional diarrhoea for a day or two, and frequently attacks of flatulent colic. Gradually the pulse gets slow, of less force than usual, and perhaps soft and irregular. A person lying down may have a pulse of not more than 60 per minute; and some cases fall to 50 or 40, and even lower than that; yet some persons do not suffer any material reduction of the pulse-rate, and when it occurs it may be recovered from. These patients generally get very melancholy, and perhaps also very irritable; and these mental symptoms may be sharp when the actual jaundice is moderate. Some of these cases fall into persistent hypochondria; while protracted cases have a variety of nervous symptoms, as slight delirium, stupor, convulsions, trembling of the muscles, a dry and brown tongue, and paralysis of the bladder. These latter symptoms usually precede death; and sudden discharges of blood from the nose, stomach, bowels, kidneys, or under the skin, are very serious. All persons with chronic jaundice grow weak, slowly lose fat, get exceedingly emaciated, and remain so for months. Women are often troubled with pruritus of the genitals.

Treatment.—Acute jaundice is usually recovered from, unless caused by shrinking of the liver or destruction of its tissues. Chronic jaundice is lingering and very uncertain; and as this form generally occurs in persons of advanced years, it is very likely to continue until death.

In treating it, the medicines that increase the secretion of bile are not the proper ones to use,—such as leptandrin; but those which aid in the discharge of bile from the ducts and gall-bladder, such as bitter root, wahoo, rhubarb, boneset, etc.

For acute cases, give pills made of soft extract of butternut stiffened with powdered bitter root; or capsules (or powders) of one grain apocynin and two grains each rhubarb and cooking soda. Give at bedtime, making the dose large enough to act a little freely in the morning. During the day, use an infusion or a syrup made of two parts queen-of-meadow, one part boneset, and a little ginger, taking a proper dose half an hour before each meal and midway between the meals.

In chronic cases, the Compound Gentian Syrup is a good tonic

to use before meals ; and so is a preparation of one part barberry bark, two parts each juniper berries and wahoo, and a little ginger, tinctured on equal parts cider vinegar and water, and holding all the sugar it will dissolve in the cold. Another proper tonic may be made of one part each golden seal and dwarf elder root, and half a part each wahoo and scullcap, and a little ginger. Digestion will be aided by this preparation, and also nervous symptoms and the kidneys, it being always desirable to sustain the latter organs. If diarrhoea is troublesome, wahoo and barberry cannot be given ; and small doses of soda hyposulphite with mint essence should then be given two or three times between the meals.

While using either of the above tonics, it is a good plan to use one or two pills of prepared ox-bile two hours after each meal. These are made by mixing equal parts of fresh ox-bile (or that of the pig) and diluted alcohol ; standing twelve hours, straining off the clear liquid, and evaporating this till it becomes stiff enough to form into pills by adding a little powdered golden-seal. Such pills are excellent to aid digestion in the duodenum, supplying in part the lack of bile in the patient.

Jaundice returning from time to time, with paroxysms of sudden and severe suffering, is due to gall-stones, and will be treated of elsewhere. If there has been a previous history of steady failure of health, and after some months a jaundice with severe darting pains, it is probably a case of cancer of the liver.

All jaundiced patients should be very careful to avoid fatty foods, use fruits and vegetables chiefly, drink buttermilk when found agreeable, but use no coffee nor anything of a spirituous character.

CHAPTER LIII.

INFLAMMATION OF THE LIVER.

It is chiefly in tropical and sub-tropical countries that inflammation of the liver is met ; and there it prevails somewhat extensively among men during middle life, being much less frequent in women and very rare in children. But it is also a malady of colder latitudes. Malarial influences are its common cause ; the intemperate are chiefly its victims ; though it may attack those who are

strictly temperate, yet indulge in rich and hearty foods while taking little muscular exertion. In many instances it is preceded by a term of congestion of the liver, the passage from this condition to an active inflammation being provoked by some indiscretion or exposure. It may occupy the whole organ; but oftener is present in only a part, especially the right lobe. It may be deeply seated, or near the surface, and may be acute and severe, or chronic and insidious. Occasionally it results from injury over the organ, and from sudden and too violent exertion.

Symptoms.—These vary considerably in their severity, but generally come on rather gradually. Impaired appetite, perhaps loathing of food, a thick white fur upon the tongue, constipation or bilious diarrhoea, and irritability of the stomach, are the usual and early symptoms. Frequently the onset is marked by chilliness or slight shivering, followed by a moderate fever and flushed face. This fever is not severe, the pulse ranging from 100 to 110. A dull pain and heavy feeling in the liver; some tenderness, which is increased by pressure or by attempting to lie on the left side; frequently (but not always) pain in the right shoulder; thirst, probably bilious vomiting, and some enlargement of the liver, are the usual symptoms. If the inflammation is nearer the upper surface of the organ, the pain is lancinating and very severe, shoots upward into the chest resembling pleurisy, causes a short and painful cough, and short and distressing breathing, and sharp suffering on pressure or motion. If it is near the under surface, vomiting is more frequent and painful. Jaundice is not usually present in any material degree, except the inflammation is on the under side of the liver and involves the large gall-ducts.

Very painful cases do not involve the deeper parts of the organ and may subside in from three to five days. When it is deep-seated, it is likely to abate in ten or twelve days. But there is always a liability that the acute form will gradually sink into the chronic form, and then linger for months or years in a condition midway between inflammation and congestion, with acute attacks provoked on slight occasion. In the intemperate and malarial, there is always danger of one or many abscesses forming; and those who have used calomel or blue mass are exceedingly liable to such abscesses, indeed seldom escape them. Severe attacks may develop abscesses in the prudent, but this is not common. Abscesses of this organ will be spoken of in another section. In young

people, inflammation of the liver is many times complicated with desentery.

Treatment.—Apply over the liver large warm poultices of flax-seed, to which should be added a tablespoonful of boneset and a teaspoonful of ginger. Renew these as they get cool. Every few hours give a hot bath to the feet and lower extremities, and apply hot bricks or irons wrapped in damp cloths. Unload the bowels with Rochelle salts or a seidlitz powder, which will be found suitable each day while the acute stage lasts, if dysentery is not present. During the fever, use the Sweating Powder in moderate quantities every half hour, adding a very small portion of lobelia to cause gentle nausea. One of the best diaphoretics for this fever is a warm infusion of equal parts boneset and camomile, and two parts white root. It should be drank very liberally till sweating is induced, and then in small quantities. Though bitter, it is very effective; and a bitter taste is not often objected to by bilious patients. If this infusion cause nausea, so much the better; and when the symptoms are severe, it is best during the first two or three days to stir up nausea in this way, and then add a good draught of lobelia and get free vomiting, which may be repeated in twenty-four hours.

After the acute symptoms abate, the case is to be managed as a congestion of the liver. It will not do to be negligent after this inflammation, else a dangerous congestion will be fixed on the patient, and there will be serious liability to abscesses. There is always a tendency to relapses, and to establishing chronic inflammation that slowly wrecks the constitution. Hence the demand for rigid abstemiousness in diet, drinks, and other habits.

CHAPTER LIV.

ABSCESS OF THE LIVER.

ABSSESSES of the liver are not so common in cold as in tropical sections, and are not at all so frequent as they used to be. They occur as the result of inflammation of the liver, of exposures in malarial districts, of alcoholic habits, high living, and the use of calomel and other preparations of mercury. In all cases the

liver is first crowded with blood and swollen ; and there may be one or two large abscesses, or a great number of little ones.

Symptoms.—When acute inflammation precedes the abscess, the forming of pus may cause a few fits of shivering during fever, and perhaps some throbbing pain in the liver. But sometimes these symptoms are not present, and the usual signs are : A pale and muddy complexion, seldom tinged with yellow ; a low and irregular feverishness, the pulse being about 100 ; impaired appetite, irritable stomach, attacks of vomiting, a white tongue that at times becomes clean ; dull pain in the liver increased on pressure, fullness or probably bulging of the right side ; occasionally pain in the right shoulder or under the shoulder blade. Constipation alternates with diarrhoea, gradually increasing.

Such symptoms are persistent although not always severe ; but the patient steadily loses in general health, and slowly goes downward. If the abscess is on the upper side of the liver, pain about the ninth rib becomes sharp and extends upward, and there are shortness of breath and cough. If it is near the gall-bladder, jaundice will be added to the muddy and pallid complexion, and vomiting will be more frequent. Abscesses will, if considerable in size, be likely to burst in some direction, according to their situation,—as the bowels, outwardly, through the lungs, etc. When they burst into the cavity of the abdomen, a sudden and aggravated increase of the suffering takes place, and death in about three days. Bursting in other directions, a discharge of pus will be noticed ; which, when by the lungs, in many respects simulates consumption. Discharges in limited quantities keep up for many months, the patient in most instances steadily losing ground ; sometimes improving for a few months, and then sinking ; but again recovering after a year or two, if the constitution has not been broken by intemperance and mercury. Discharge by way of the lungs is most favorable. Small abscesses, or large ones deep-seated, seldom burst, but carry the patient gradually down, perhaps with dropsical swellings toward the last.

Treatment.—The possibility of abscesses following inflammation and acute congestion, makes the active treatment of these maladies exceedingly important. Once they have been formed, no active treatment can be instituted. Keep the sound parts of the liver in gentle action by the measures advised for congestion, but on no account attempt to urge it to vigorous secretion. Be prudent in diet, using none but the plainest and simplest

foods, including fruits and succulent vegetables. On no consideration allow the least portion of alcohol, even in beer or other malt liquors. Sustain the tone of the system gently by vegetable tonics, and secure a change of residence if possible.

CHAPTER LV.

FATTY LIVER.

PERSONS of luxurious habits, using foods that are fatty and are cooked in fats, living in high temperatures, keeping their houses very warm, and taking little muscular exercise, are inclined to accumulate fat throughout the body. They steadily become obese, and the abdomen enlarges with increasing fat. Under such conditions, the liver is prone to become fatty and softened. Persons who have passed the middle period of life, and especially women, are most liable to this trouble; but beer-drinkers and gourmands are also common victims.

Progress in developing a fatty liver is slow—five, ten, or twenty years. The organ enlarges, particularly downward; does not alter its normal shape, but is softened by fat globules taking the place of the normal tissue. For a long time it causes no especial symptoms, no jaundice or dropsy, no pain beyond some uneasiness on lying upon the left side. But the skin has a peculiar half-transparent, nearly bloodless and waxy look; and to the touch a feeling of smoothness, looseness and flabbiness. This appearance is significant. In time the heart is liable to palpitation, and is weak in force; more or less dyspepsia comes on, perhaps repeated and severe fits of indigestion; the bowels are inclined to sluggishness, and the breathing is often embarrassed after meals or upon moderate exertion. Finally, there are attacks of prolonged biliary vomiting and mild jaundice, with giddiness or faintness, and the patient passes away.

Treatment.—Medicine can do little, but much depends upon an abstemious life, strict avoidance of fatty foods, daily exercise in the open air (as walking and horse-back riding), rather cool rooms, and no liquors. Such measures should be begun so soon as a tendency to fatty liver is suspected, and persevered in firmly though these patients are usually quite disinclined to this course.

Then any signs of dyspepsia or torpor of the liver are to be relieved by the proper remedies, using those of the milder class.

CHAPTER LVI.

GALL STONES. BILIARY CALCULI.

DURING middle life, rarely before 25, the bile may become viscid and tenacious, adhering to the sides of the gall-bladder and obstructing the gall-ducts. It may then also form into hardened masses, called gall-stones, usually with some lime compound as the center around which some of the elements of bile slowly gather. One or two such hardened bodies may be present, attaining a size of one-fourth of an inch to an inch or more in diameter; or there may be numbers of a moderate size, in some instances one to two hundred being found after death. Secretion of imperfect bile, due to chronic congestion and torpor of the liver or to malarial influences, is the original cause whence these concretions arise; and it is probable that sometimes the larger ones are years in forming, not giving any especial troubles other than a slight "biliaryness" until they escape from the gall-bladder and get lodged in the ducts.

Symptoms.—When a gall-stone leaves the gall-bladder and starts on its way to the bowels, it causes colic paroxysms of great suffering. These paroxysms return with something like regularity,—every day, every second or third day, once in seven days, once a month; and I have known some persons who had regular annual attacks of this kind, returning every day for days and weeks together, till the calculus reached the duodenum.

The attacks begin often with a dull pain under the right ribs, extending at times to the stomach and the right shoulder, accompanied by chills resembling an ague, probably by vomiting, and slight fever. In the more distinct cases, however, this pain comes on suddenly, is of a shooting, tearing and burning character, and of terrible severity. Vomiting with it is common, the food and then colorless mucus being thrown up; the right lobe of the liver generally gets tender, the stomach sometimes tender, the sufferer writhing in agony. In prolonged cases there may be delirium, and women may develop strong hysteria. A slight feverishness, which is noticed at the onset, sometimes will pass off quickly and leave the patient cool, the face pallid with dark rims around the

eyes, the nose pinched, the pulse very frequent and small, and at last a cold sweat over the whole body. In some cases, the pains extend to the ovaries, uterus, and lower extremities. Jaundice is usually present in some degree, at times is severe, in a few cases is almost wanting. When the gall-stone is discharged into the duodenum, the suffering ceases quickly and the jaundice soon disappears. This may occur in a few hours and end that paroxysm; or it may occupy several days with or without intermissions of rest. Very few people die in a paroxysm, but all are greatly exhausted by such terrible suffering; and the repeated expulsion of these concretions is always dangerous. A mass may get fastened in the duct and be too large to get out, causing dangerous if not fatal abscess. By care in examination, the calculi may be found in the faeces.

Treatment.—During the paroxysm, apply over the side a large flaxseed poultice with one half lobelia herb, and keep it warm with heated bricks or irons. Give an injection of a heaping teaspoonful of powdered lady slipper in a very strong decoction of boneset containing a very little starch; and have this retained in the bowel, repeating every two hours as long as necessary,—or every hour in bad cases. By these measures the gall-ducts will be relaxed and the escape of the calculus hastened. If relief is not obtained soon, put nearly an even teaspoonful of powdered lobelia herb in each injection. Give by the stomach a little weak tea of spearmint or catnip every twenty or thirty minutes.

After a paroxysm has passed, measures must be taken to soften any remaining gall-stones and prevent the formation of others, so that future paroxysms shall be prevented. This is to be done by getting the liver into healthy action by the means elsewhere directed for congestion of this organ. In the forenoon and afternoon, give a large teaspoonful of the solution of hyposulphite of soda; and keep the bowels and liver well open by using at bed-time one or two of the Liver Pills, as needed. Such a course of treatment must be kept up steadily for many months, and the diet carefully regulated.

In malarial districts, and because of the regularity with which these paroxysms return, there is a temptation to use quinine; but any such article is entirely out of place in cases of gall-stone, and will increase the sufferings. Women thrown into hysteria will soon break down under this combination of troubles, unless the nervous system is well sustained while treating the liver difficulty.

CHAPTER LVII.

INTESTINAL WORMS.

ABOUT thirty different kinds of worms are known to infest the human body, all of which are likely to find their entrance to the system by way of eggs in our food and water. Once in the body, they go through various processes of development, some rapidly and some very slowly,—these changes being curious studies to those inclined to pursue them. Most of them lodge in some particular part of the alimentary canal best suited to the habits of each, while others migrate from place to place. I shall consider them all under three general classes.

I. *Long Round Worm.*—This is the most common of the intestinal worms, troubling children very much, and sometimes becoming exceedingly annoying to adults. It is of a pale or pinkish color, three to ten or twelve inches long, tapering at both ends, and looking very much like the common earth-worm. Its chief place is in the small bowels; but from thence it often migrates to the large bowel below, and upward to the stomach and even into the throat, occasionally crawling into the mouth or being vomited up. Probably it finds its way into the stomach by its minute eggs being washed down into streams and wells; and it is enormously fecund, the ovary tube of a single female being estimated to contain more than 60,000,000 eggs. These eggs, discharged with the human fæces and thrown upon the open ground or into a shallow vault, may thence easily be washed into the ground water that finds its way into shallow wells, small streams, etc. This is not a pleasant reflection, but it is a fact that has been demonstrated; and the round worm is in this manner, much oftener than by eating sugar or anything else, introduced to the stomach of children and then hatched in the small bowel. This worm is very common in some sections of the country, as in the warm latitudes, flat lands, new countries, etc.; while in some localities it is almost unknown,—especially where wells are deep and the surface flow is rapid.

The signs of the presence of worms are often indistinct and uncertain; and it is only when discharged by the bowel or by the mouth that one can be positive of their presence. Yet they cause numerous disturbances and irritations, a number of which taken

together will be pretty safe ground for concluding that worms are troubling the patient. Among the more common of these are, itching of the nose, sudden paleness with a probability of one cheek being flushed, startings and gritting the teeth during sleep, irregularity of appetite, frequent colicky pains accompanying catarrhal indigestion, offensive breath, darkened bands under the eyes, dilation of the pupils. These signs all vary in degree, sometimes being trifling but at other times becoming very decided. Some are troubled with a short, abrupt, almost barking cough, which is void of expectoration and is not relieved by cough syrups. Others have quite decided dyspeptic symptoms, and lose appetite and flesh unaccountably, deriving no benefit from the usual treatment of indigestion. Some children get much distended in the abdomen, which is heavy and doughy to the feeling; but others get thin; and many are peevish, irritable and sullen in disposition, and are wofully cast down by the simplest reprimand. No small number of these children have feverishness, which is mild, accompanied by bright spots on the cheeks, and persists for a few hours from day to day without being relieved by any ordinary fever treatment. Headache, dizziness, nausea, vomiting, sudden chokings, and various other symptoms are at times apparently connected with worms, or at least are much aggravated when worms are present. Diarrhoea with large mucous discharges is not an infrequent occurrence; and some nervous children are troubled with severe nervous twitchings in the sleep, possibly with some delirium, and even by severe convulsions. In some very rare cases, the bowels have been perforated by worms and death has followed.

Treatment.—Where any considerable number of the above symptoms is grouped together, and no clear cause for them can be discovered, and they do not yield to such ordinary treatment as would be given for poor appetite or cough or nervousness, then it will be reasonable to resort to measures calculated to expel worms even though none of these parasites have been found in the passages. Among the most direct means for their destruction is santonin, a concentrated preparation of one of the wormwoods. It has the advantage of being tasteless. It is a poison to the worms, killing them outright, sometimes causing only mucous stools with fibrous appearances as if the parasites had been “cut up.” Its use will be described elsewhere. A large dose of castor oil, or a fair dose of butternut, bitter root or other reliable physic,

should always follow the use of santonin. So effective is this article that it has replaced almost all other worm medicines. Another effective one, especially when an enlarged abdomen suggests great accumulations of mucus, is cowhage. Among the older remedies were pink root and senna by infusion; a few drops of turpentine on sugar; oil of wormseed and turpentine in castor oil; wormwood infusion. But these are nasty and bitter doses, and are by no means so reliable as santonin or cowhage. These vermicides should always be given in the morning, before breakfast. A few grains of salt at short intervals will check worm chokings and cough.

It is always necessary to tone up the stomach and intestines of these persons, so as to prevent future lodgment of the parasites. A really healthy condition of the bowels is incompatible with the presence of worms, and not unfrequently good tonics alone will effectually dislodge them. A suitable preparation may be made of eight parts bark of yellow poplar, and one part each golden seal, bitter root and senna, made into a suitable syrup and given three times a day. A quite strong infusion of peach leaves, always made fresh each morning, when drank freely will often dislodge the mucous nest and with it the worms; and may be accompanied or followed by the use of a tonic.

The number of these parasites that may be expelled in any case, is quite various. Sometimes but one or two are removed, and at once all the unpleasant symptoms subside. In other cases there may be half a dozen or more. Exceptional cases show enormous numbers as having accumulated in the intestines of young persons, from 100 to 300 having been reported. I once removed, by the use of cowhage, followed by plenty of molasses as a cathartic, 240 worms of this kind from a child of two years, and the mother then stopped counting them. Dr. Gilli, Portugal, reported a case where a child voided 510 round worms.

To prevent the future lodgment of these parasites, it is advisable to regulate the child's diet carefully for a long time, as well as to use tonics. Candy, sugar, and all other sweets, weaken digestion and so favor renewed accumulations of worms.

II. Pin Worms. Thread Worms.—These are small thread-like worms, one half to two inches long. They make their home in the pouch (*cæcum*) where the small intestines empty into the large one,—and here they may congregate in enormous numbers, great balls of them being sometimes voided. But few symptoms

are caused by them, the principal one being heat and a severe itching at the anus when the females come low down into the rectum to lay their eggs. This itching is most severe at night, is always annoying, and sometimes becomes nearly intolerable and agonizing. Worms often crawl out of the bowel; and in females they may then find their way into the vagina and cause great irritation with some leucorrhea, and have even crawled into the urethra and provoked inflammation of the water passage. When thus troubling the lower bowel, they will generally be voided in the stools and thus be detected. In some instances they accumulate in such enormous numbers in the above-named pouch of the bowel as to give the feeling of a considerable tumor in the hollow of the right groin; and occasion much loss of flesh and general nervousness. Young persons are most frequently troubled with them, but they may appear at any period of life.

It sometimes is very difficult to get rid of these little pests, which increase their numbers with enormous rapidity and cannot be dislodged by the vermifuges that will so decisively rout the long worm. Sometimes an enema of weak salt-water twice a day, with a moderate dose of aloes at bedtime, will destroy them. But aloes often causes irritation of the rectum and a tendency to piles, and so cannot be continued or possibly cannot be used at all. Daily tonics, with a goodly purgative action by a dose of Rochelle salts twice or three times a week, is many times an effectual course. I have found the most reliable way is to reach this pouch of the bowel with an injection of alkaline character. It requires from three to five pints of fluid to fill the bowel to this point, and it should always be injected slowly and at a luke-warm temperature. A very weak suds of Castile or other mild soap is suitable. Lime-water one part and water eight to ten parts, with a teaspoon of borax to each quart, is wonderfully effective. In one case I treated by this injection, no fewer than thirteen passages of the bowels were provoked within twenty-four hours, the passages consisting of balls of mucus and thread worms, the worms possibly being scores of thousands. The lump in the side disappeared, and all the intolerable itching was relieved, a few weeks of good tonic treatment effecting a cure. I have had nearly similar success in several other cases. The lime-water injection may need to be repeated in a few weeks until all the evidences of worms have disappeared.

III. *Tape Worms.*—Several forms of these exist, all fastening themselves upon the lining membrane of the small bowel by suckers or by hooks, some by both means. The point of fastening is called the head, and is small; below this is the narrow neck, from which the worm grows downward by a series of flat sections united to each other and gradually enlarging,—the head remaining stationary. A full-grown section is about half an inch long and a fourth of inch broad, flat as a piece of tape, and nearly transparent. Each section contains both male and female organs, and is a perfect being in itself. Maturity of sexual life in one of these is not attained till it has reached about the 450th remove from the head, the more and more undeveloped pieces above it being smaller and smaller as they are nearer to the head. A tape-worm ten feet long has about 800 such sections, counting small and large.

The embryos of the tape-worm are very numerous in the flesh of cattle in eastern Africa and some other countries, and occasionally in our own country. Abyssinians commonly eat their beef raw and very soon after it is killed, and tape-worm is there almost universal among children and adults. Children of other countries, eating raw scraped beef, have had tape-worm as a result. Hogs much more frequently convey this parasite among us, raw pork too frequently containing the ova. Dogs and other animals frequently are troubled with this worm, and pass its eggs in large numbers; and these may be carried into small streams or shallow wells, and thence be imbibed. When taken into the human stomach, the embryos burrow the walls and seek lodgment in other parts, where they remain enveloped in a sort of sack or cyst until the head is developed. When this degree of growth has been attained, they burrow their way back to the bowel and fasten there. Their further development then begins, the head or “nurse” merely serving to fasten the parasite to a fixed home, while the sections feed themselves by absorbing the nourishing chyle that the stomach and bowels have prepared for the body. From eight to twelve weeks are occupied in maturing the first sections, during which time the worm lies coiled up. When the first section becomes mature, its sexual life begins, and it discharges great numbers of minute eggs. Soon after this stage of sexual maturity, that section dies, and presently is discharged; and hence onward one or several sections of the worm appear in the faeces every few days or weeks, and constitute the invariable and infallible testimony of the existence of a tape-worm.

Several worms may be present at one time, and then the evacuations will contain sections more frequently. So long as the head remains fixed, the renewal and growth of sections below it will continue; and it is estimated that a tape-worm lives several years. When the developing embryos fail to find their way back to the alvine canal, they may remain in the other organs and develop to a certain degree, causing enlarging cystic tumors that are always dangerous. The liver is a favorite site of such growths, distending enormously with myriads of soft sacks called hydatids, and finally ending in death. Even the brain has been reached by them.

Symptoms.—There are no specific and reliable symptoms of the presence of this worm, the voidance of sections being alone absolute. As these segments are sure to be evacuated in due time, it is necessary to examine every evacuation carefully, day by day, when the existence of a tape-worm is suspected. Presently some sections will be found, and then the question is settled.

But a variety of symptoms springs up in greater or less intensity, which should attract close attention to the passages. They are due to the disturbances of nutrition because the worm imbibes the chyle intended for the body; and to irritations of the nervous tissues sent through the system. They may be trifling, or may become severe. A general loss of health and strength, indigestion, occasional attacks of diarrhœa, pallor, dilated pupils, irritation at the nose and anus, obscure pains about the limbs and body, and at times colic, are the more constant symptoms. Some are troubled with a peculiar and sudden sense of faintness. Among the more severe symptoms which may at times arise are, headache with dizziness, singing noises in the ears, temporary disturbances of sight, squinting at intervals, spasmoid actions, possibly convulsions. In women of nervous temperament hysterical signs may be provoked; and some show muscular tremblings, mental alienation by spells, and other serious nervous derangements,—which happily pass away when examination of the stools reveals their true source, and proper medication expels the worms. In some thin persons, a hard tumor may be felt in the bowel, usually on about a line with the navel.

Treatment.—Several quite effective remedies against tape-worm are now known, and the result of their use is generally satisfactory provided the proper course is taken in administering them. Before giving any of them, the bowels should be evacuated gently

by a prompt physic, as castor oil or Rochelle salts, the patient having eaten very lightly for two days and the physic being given in the afternoon. Use no more food that night, and give the remedy early the following morning, on an empty stomach. My own preference is for a decoction of pomegranate root, two ounces being made to yield their strength by boiling in a quart of water and reduced to about three gills. A gill of this may be given at a time, and repeated every half hour till an adult takes it all, and proportionately for a child. It sickens the stomach, though less so than the other articles; so the patient should lie down, and perhaps relieve the sense of nausea and faintness by small bits of ice in the mouth. In one or two hours after the last dose, give a goodly dose of physic—castor oil, Rochelle salts, or senna. The worm is likely to be discharged ere long.

Another excellent remedy is the etherial oil of male fern, which should always be recently prepared. An adult may take from half a drachm to a drachm of this once in two hours for three doses; then take a physic. Another article is kousso, of which one-half ounce to ounce may be given to an adult within two hours, the article being powdered and the amount divided into about four powders or capsules. It usually causes more disturbance of the stomach than either of the others. Follow with physic, as before.

A very simple remedy has been found in the seeds of the common pumpkin. About two ounces of these seeds, from which the outer husks have been removed, are to be beaten into a thin mass by the gradual addition of water till a pint of a milky mixture has thus been made. This is to be taken on an empty stomach in the morning, without any food after it, but with the use of as much cool water as the patient can possibly drink within the next two hours. At the end of two hours take a pretty full dose of castor oil. If this does not prove successful the first day, it may be repeated the next day, and again the day after, the person in the meantime eating very little. Probably in a decided majority of cases this measure succeeds, but it fails in some, and then either of the above methods may be followed. Two ounces of pumpkin seeds *after* the husks have been removed, is the proper amount.

A worm is not effectually removed unless its small head is found in the faeces, and these should be examined carefully for it, as it will reproduce the worm if not removed. The usual length of a tape-worm is from ten to twenty-five feet; and when discharges of sections would aggregate a length of one hundred feet

or more, it may be set down as a fact that three or four worms were present, and the heads of that many should be searched for in the evacuations. If signs of worms re-appear from an ineffectual effort at dislodgment, it is not advisable to renew the remedies for a week or more.

CHAPTER LVIII.

TRICHINOSIS. TRICHINIASIS.

THESE are terms applied to the disease caused by the presence, in human muscles and elsewhere, of a minute worm called Trichina—*made of hair*. The full-grown male worm measures about one-eighteenth of an inch in length, the female being nearly double that or about one-eighth of an inch, round and thread-like. They find their way into the intestines of man from his eating the flesh of animals, and especially of pork, in which they often exist. In two days after reaching the bowel they are developed, and in six days have produced their young,—a single female laying from 300 to 500 eggs. The young larvæ from these eggs are hatched in the intestines between the sixth and fourteenth days, and at once begin to burrow through the walls of the bowels and seek a home in the muscular tissue. In doing this they migrate to all parts of the body, the muscular structures of the abdomen and chest receiving the largest numbers, some finding lodgment in the limbs, the soft muscles on the larynx and the under side of the tongue being a favorite position for them. Like other parasites, this one seems to find a favorable home for breeding in the mucus of the intestines, where they grow rapidly, and where the mature worm probably bears its young repeatedly during a period of seven or eight weeks.

Once in the muscles, they coil themselves up in a spiral, and during the next six or eight weeks become covered with a firm and almost bony shell, constituting small, white and hard specks of an oblong shape in the structures where they are found.

The larvæ of trichinæ exist in small numbers in some pork, and do no damage whatever. It is only when their numbers become great that injurious results to man follow their ingestion.

In the pig they sometimes exist in considerable numbers without causing any appearances of disease; but when quantities of them are present in the muscles of the animal, they may dot the flesh with those small, white and oblong spots, and render the immediate fibrillæ of these brittle and granular. When they do cause signs of illness in the animal, the symptoms usually are loss of appetite, diarrhœa, increasing depth and hoarseness of the voice, indisposition to motion, a particular aversion to running, and a dragging movement to the hind extremities when running is attempted.

The proportion of hogs afflicted by the larvæ of trichinæ in their muscles, is very much less than some people would have us believe; yet evidently is (or has been) greater in some portions of the United States than in Europe. Official investigation of this question has been made; and the Chicago report of 1866 showed some degree of trichiniasis in one hog of every fifty in the different packing-houses and butcher stalls of that city. In some of these, the number of trichinæ in a cubic inch were but 50; in others there were several thousand to the cubic inch; and in twenty-eight specimens where the examinations were very carefully made, the number of trichinæ was from 15,000 to 18,000 to each cubic inch of the hog's muscle.

As in man, they congregate in largest numbers among those muscles which are softest, as of the belly and about the ribs; and are in much smaller numbers among the firmer muscles, as the hams.

The sources of trichinæ in the hog are unknown; but it is quite evident that crowding, uncleanness, deficient supplies of pure running water, and similar causes and associates of filth in this animal, must be the most prolific means of spreading it among them. Filthiness in keeping and feeding this naturally filthy animal is a too common rule, even with thrifty American farmers; and about distilleries and similar places the care of them is abominable in the extreme. The price of this is too frequently paid for in disease and death among men; and we cannot wonder that American pork has fallen under the ban in Germany and other European countries, where so much has been suffered from it. Interested politicians would fain make us believe that the German objection to the American product is a wily scheme of Bismarck to injure our trade; but it would be far wiser to look squarely at the facts nearer home, enforce the need of more care and cleanli-

ness, in feeding our hogs, and rigidly inspect every animal slaughtered in or near our cities.

The larvæ of the trichinæ will lie dormant in the muscle of pork for a long time, and arouse to active life when they get into the congenial soil of the mucus in the human intestines. Salting and smoking have no effect upon them; and meats cured in these ways, if they contain trichinæ, will convey them alive to people who partake of them. A heat, in cooking, that reaches the boiling point is the one sure means of their destruction. It has been at times asserted that a heat of 170° F. will put an end to them; but this is very far from being certain; and the only point of safety is a temperature of 212° F., continued long enough to reach to the innermost parts of the piece of meat for several minutes. Full reliance can be placed on this, for no trichinous larvæ can possibly retain life under that degree of heat.

A number of outbreaks of trichinosis have been reported carefully, some of them in America but most of them in Germany. In every instance they have been due to eating pork in some form, and especially sausages, that was but partially cooked, or merely smoked and salted without being cooked at all. Pork in this state is especially liked by the Germans, hence the greater liability to trichinosis among them—even when they come to America and retain the customs of their native land. Among the more notable of these outbreaks, the following may be mentioned:

At Marion, Iowa, nine persons in one family were attacked between the 5th and 14th of May, 1866; and five of the nine died. They had eaten sliced ham, smoked but not cooked. A sow to which some of this raw ham was fed, died with all the symptoms of hog cholera; and her muscles were found swarming with trichinæ. Four other families in the same county, and about the same time, developed six cases of the disease; and they had all eaten of sliced raw ham from a hog the other parts of which were salted down in strong brine, and these pickled portions were found pretty full of the trichinous cysts. Aurora, Ind., and some other places have suffered.

At Berlin, in 1863, seven men partook of a meal that included portions of raw pork; in the course of four days all were seized with symptoms of trichinosis, and four died.

In the fall of 1863, at Weltstadt, Prussia, 103 persons, mostly strong men, took dinner at a hotel, the meal including fresh sausage-meat, smoked. Within a month, 100 of the 103 had trichino-

sis, and 20 of them died. Among many outbreaks in various parts of Germany since 1860, one at Calbe gave 30 cases and 8 deaths; at Wedesleben, 300 cases and 40 deaths; at Gorlitz, 80 cases; at Hittau, 57 cases; at Magdeburg 300 cases, etc.

A small number of trichinæ in a human being, do not appear to cause any material disturbance. But they multiply so rapidly, in such a marvelously brief time, that the numbers are likely to increase enormously; and when their swift migration commences, it cannot be otherwise than the occasion of severe and dangerous trouble. The immense number that may be produced in a few days has been estimated carefully. In a case reported by Dr. Voss, they were estimated at 7,000 to a cubic inch of muscle. Prof. Dalton examined a piece of muscle one-fiftieth of an inch thick and one-twelfth of an inch square, taken from a man who had died under the care of Dr. Schnitter, in New York. It was an average specimen in the case; and this bit of muscle contained twelve trichinæ, which would give 85,000 in a cubic inch. In one of the fatal Iowa cases, 104 trichinæ were counted in a piece of muscle one-twelfth of an inch square and one-twelfth of an inch thick, which would give 180,000 in a cubic inch. On such examinations it has been computed that at least 2,000,000 trichinæ existed in the muscles of a man who died from this disorder in three weeks after eating some smoked but uncooked sausage.

Symptoms.—These are by no means uniform, yet are tolerably characteristic. When the numbers present are sufficient to cause disturbance, symptoms of indigestion, with dizziness, nausea, and probably vomiting, will begin in a few hours; and after a little time feelings of decided prostration, some feverishness, and considerable restlessness. In mild cases, these may terminate after a few days of lost appetite and feelings of illness; and no trichinosis be suspected except as one may remember having eaten some underdone pork. But in bad cases a prostrating diarrhoea sets in and continues for several days, the fever becomes more marked, and the muscles of the extremities become stiff and painful, not unlike a muscular rheumatism, and the patient is helpless in bed. These symptoms last from six to ten days; and then begin the symptoms due to active migration of the hatched larvæ from the intestines to the muscles.

In this second stage the fever increases, the pulse rising to 120 or more; respiration and heat being also increased. The muscles swell, and become exceedingly sore and painful, the slightest touch

or movement causing severe distress. The eyes are very sensitive to light, and their ordinary motions are painful; the eyelids, and probably the face, are swollen and puffy; the patient is exceedingly irritable, unable to sleep, and loses strength rapidly. He lies on his back, helpless, unable to move or even to yawn, cannot eat and can scarcely swallow from muscular soreness and helplessness; may perspire freely. As the case becomes more grave the muscles become paralyzed from the destruction of their minute fibrillæ by the parasites; the limbs become flexed and paralyzed; diarrœa is continuous and exhaustive; and delirium may set in. Death, when it occurs, usually takes place in the third or fourth week. When the patient is vigorous enough to endure this migration of the original progeny, which usually occupies four weeks from the ingestion of the baneful food, the symptoms gradually abate and he starts toward a very slow convalescence. During recovery, the appetite becomes voracious, flesh accumulates rapidly, and the cuticle is likely to peel off to some extent. But if, now, a new brood of the parasites is produced in the intestines, all the symptoms start afresh, chest troubles are likely to be added to them, and the vital powers will soon collapse.

Treatment.—Nothing can be done toward reaching the larvæ in the muscles; and all hope of destroying them, or of arresting their progress, is at an end when once they have started on their journey. It is not only useless, but is debilitating and therefore dangerous, to take turpentine, arsenic, zinc and chromic preparations, or anything of the kind, in the hope of now destroying the trichinæ.

If the symptoms begin soon after partaking of underdone pork, a very prompt emetic should be given, to dislodge the contents of the stomach as quickly and thoroughly as possible. If several hours have elapsed and the food has passed below the stomach, a brisk cathartic should be given for a similar purpose—as antibilious physic or senna infusion. This purging should be both prompt and thorough, that everything in the alvine canal may be cleared out. Then the strength of the patient must be sustained steadily and judiciously, in the hope that he may endure the great tax upon his strength while the process of migration is going on. Light and soft and fluid foods must be urged upon him regularly, and at all hazards; the stomach may be quieted by an occasional small effervescent draught and any mild tonic used by infusion at short intervals.

CHAPTER LIX.

OBSTRUCTION OF THE BOWELS. *

MORE or less complete obstruction of the bowels may be caused by accumulations in them of extremely hardened faeces, undigested food, such foreign substances as cherry pits and other things of the kind that have been eaten, the pressure of tumors growing in the abdomen, by hernia, and by paralysis of the muscles of the intestinal canal. All these forms of obstruction will be treated of in their respective places. In this chapter I wish particularly to speak of that obstruction which is commonly known as "knotting of the bowel," and consists in a part of the intestine getting pushed into the part immediately below it, and becoming fastened there by the muscular wall of the bowel suddenly contracting. It is called *invagination* of the bowel.

This dangerous accident usually occurs during forceful efforts at stool. It is most common in children, occurring sometimes in quite young children; but is sometimes met with in adults. When not soon overcome, the parts swell, inflame, and are very likely to become gangrenous,—thus causing much suffering, and death in from four to seven days. Its most usual position is in the right groin, at the junction of the small bowel with the large; but it may occur at almost any part.

Symptoms.—These generally begin as a sudden and severe colic, which it must be remembered a hernia or rupture may also do. At the same time there are strong straining efforts at stool, and there is a probability of violent stools mixed with bloody mucus. Such bloody passages are always to be expected in this difficulty, because of some of the small blood-vessels in the bowel breaking down. From their appearance and the straining efforts, they may suggest a case of dysentery; but the remainder of the symptoms are not like dysentery. After a few hours, the portion of the bowel below the obstruction is emptied, and then there will be no more faeces in the stools, but small amounts of a thin bloody fluid will be passed with severe straining. The patient gets extremely restless and shows evidences of prostration; the distress increases in severity, with a drum-like distension of the abdomen by flatulence, and rolling movements of the bowels. The persistent straining efforts with small stools, generally suggest that a physic is needed; but it is soon found that no cathartic will

operate. Nausea and vomiting presently follow ; the vomiting returns at short intervals with a great sense of exhaustion, the face becoming pale, and the features pinched after a few hours ; everything is thrown out of the stomach violently, the ejecta soon becoming very offensive, and finally the faeces above the point of obstruction beginning to be thrown up. If not soon relieved, peritoneal inflammation follows, and death in a few days. If the obstruction yields, it is likely to do so suddenly, with free stools and an immediate relief of all the symptoms. In most persons, the swollen part of the obstructed bowel may be felt as a cylinder-shaped tumor, and especially if in the region of the right groin ; but this cannot always be felt, and the more so after the drum-like distension has begun.

Some cases, and these oftenest among adults but sometimes also in children, advance more slowly. There are alternations of diarrhoea and obstinate constipation, with attacks of colic, for several days. Relief is attempted by sharp physic, and for a time appears likely to succeed ; but the stools are of bloody water and mucus rather than of faeces, and do not abate the distress or the sense of prostration. Attacks of vomiting presently set in, and steadily increase in frequency and severity till the above general symptoms are developed.

Now this line of history in the symptoms may easily deceive persons, and lead them to think of some other trouble than of a knotted bowel. A hernia (rupture) strongly resembles it ; but a hernia always shows some bulging or swelling just under the skin, rather than a lump or tumor deep in the abdomen, and does not give those bloody stools that mark this invagination of the bowel. So obstinate is the constipation in this obstruction, that dose after dose of strong physic is apt to be given, each dose merely aggravating the trouble ; hence in any case where a suitable use of physic does not move the bowel, and injections also fail to get a reasonable evacuation, let the attention turn to the probability of invagination, which the discharge of a little bloody water and the accession of offensive vomiting will certify.

Treatment. — Probably it is only after the pretty liberal use of, and subsequent failure with, active cathartics, that the existence of this invaginated obstruction is likely to be detected. Any further use of cathartics is wholly inadmissible, and increases the tightening of the folds of the bowel into each other without it being possible for them to open the passage. The persistent

vomiting may suggest the use of injections of senna to restore the downward movements of the bowels; but the fluid and bloody discharges show that the lower bowel has been emptied, and cathartic injections can do no good, but are a waste of valuable time. The only hope lies in bringing to bear a gentle and steady pressure, with dilation, from the lower bowel upward, that this may loosen the spasmodic grasp upon the portion of the upper bowel that has been forced downward.

To accomplish this, I have in several instances succeeded perfectly by slowly and carefully filling the lower bowel with a tepid injection, so as to reach up to the place where the knotting exists. An infusion of catnip made rather strong, with an even tablespoonful of boneset (or lady-slipper) and a teaspoonful of lobelia herb to each quart, has given me entire satisfaction as being at once soothing, relaxing, and gently sustaining. It will require from three to four quarts of this infusion, which is to be kept at an even tepid warmth. The infusion may be thickened with some barley water.

It would not be possible to throw this amount suddenly into the bowel. It can be done only by slow degrees, and may occupy from two to five hours in the procedure. I once took over six hours in doing this work, having failed twice in the same day by occupying only three hours. A strong and sound elastic syringe is to be used, and the bulb squeezed slowly that the fluid may pass into the bowel gently. If the fluid should be thrown in quickly, a violent straining effort to force it out will be provoked after the bulb of the syringe has been emptied a few times, and the patient then is so distressed that the procedure will have to be discontinued. At the very best, and with the utmost caution, these straining efforts will be started up as the fluid of the injection reaches higher and higher; and, at each straining effort, the emptying of the syringe must be lessened, or entirely discontinued, until the bowel gets soothed again and the straining stops. At the same time the anus must be held firmly and steadily, yet gently, with a compress formed of a number of layers of soft muslin wrapped around the nozzle of the syringe, and pressed upward that the straining or tossing of the patient may not force out any of the fluid. The patient would better lie on his back, with the knees lifted up and the heels to the buttocks, which is preferable to any other position. It is necessary to have a steady assistant to hold the compress and to keep the syringe accurately in

its place in the bowel. From time to time the abdomen over the site of the obstruction should be rolled and kneaded slowly and carefully, but deeply, with the hand.

With due caution and perseverance, this course is reliable, as I have ample experience to show. It will, if sufficient *time* be taken, reach into the upper and small bowel far beyond the point at which it is the approved medical opinion all injection fluids will inevitably stop. If the injection is hurried, this cannot be done, so everything depends on "making haste slowly." If the injection is by any means discharged before the obstruction has been overcome, rest an hour and then proceed as before. I had to work for two entire days in one case. At the moment of the complete reduction of the invagination, the patient is likely to experience a sudden yielding in the part, the tumor is found to have disappeared, and soon afterward there will be copious evacuations of offensive materials. The bowel will remain sore for many days, so the patient should be kept perfectly quiet, and fed on bland foods as for inflammation of the bowels.

Air has been thrown into the bowel in a similar manner, and is sometimes successful. It has the advantage of a greater elasticity than a fluid, but sometimes its compression when thus injected will cause sharp colicky distress, and the form of injection I advise has the great advantage of soothing the patient and lessening his vomitings.

CHAPTER LX.

ABOUT TAKING AND BREAKING A COLD.

It is an exceedingly easy thing to "take a cold," and a great many people have it without having "the least idea in the world how they got it." Downright carelessness is the foundation of the majority of colds; but a great many others, and very severe ones, are the result of overweening carefulness. Often a cold is a trifling matter, so very trifling that many people will not consent to pay any attention to it; but in the main it is a serious matter and always demands thorough attention, for in one form or another colds manage to cause more deaths every year than any other trouble in all the catalogue of ills.

A brief consideration of what a "cold" really is, will assist to an understanding of its prevention and its management.

Those colds which come to us most consciously, are due to some direct exposure to wetness while the temperature is at a much lower point than that of our inner body, (which is 98° F.), the prevalence of a wind actively hurrying on the trouble. "Cold contracts," is an axiom in the living body as well as in merely physical matter. Exposure under the above conditions contracts the millions of minute blood-vessels on the surface, and by such contraction forces a greater or less portion of their blood out of them. This causes the surface to look pale or "blue"; and at the same time the diminished amount of blood and other fluids at and under the surface leaves it to shrink, even to become shrivelled or pinched.

Blood driven from one part of the body by the contraction of its vessels, must of necessity accumulate in so much the larger amount in some other parts where the vessels are forcibly dilated to receive it. Driven from the skin and the parts directly underneath, it is compelled to find its way to some or many of the inner organs. Which of these inner organs will now receive the greater amount of this blood, depends on a variety of circumstances, which at times may be quite complex.

The rule is that such inner blood-vessels as have been weakened by any cause, will most readily enlarge before the flow of blood from the outer vessels, and will have the less strength to throw this flow outwardly again; hence these are the inner vessels upon which the blood accumulation will show the chief disturbance.

For example: If a draught of cold air has played about the head and throat, the blood-vessels of the nostrils and upper air-passages will have been chilled by it and somewhat weakened; and chilliness forcing the blood from the surface now causes it to accumulate most quickly upon these parts where the vessels have been a little weakened and therefore are the least able to resist the inward flow. The result is a "cold in the head." If the blood-vessels in the lower air-passages have been chilled by breathing cold air, the result will be a bronchitis. If there have been considerable exposure, the surface being severely chilled and the breathing of very cold air at the same time lowering the temperature of the lungs, a prompt pneumonia may be expected. If over-eating of hearty foods have engorged the stomach and bowels, exposure may provoke a diarrhoea or a congestion of the

stomach. A woman thus exposed at or within a short time of her usual period, is very liable to suffer in her womanly function. If a large meat diet have been indulged and thus taxed the kidneys for some time, disturbance of these organs is most probable. And thus the effects of outward cold may be felt on one or two or several of the inner structures, according to the present or previous condition of these structures.

It is not always necessary that this outward chilling shall be long continued. The severity of its effects will depend upon the degree of surface change induced, the protracted exposure of course making the greater change. One who is accustomed to out-door life, has the blood-vessels at the surface full and firm and capable of resisting a great amount of cold. And in such a person the vessels of the lungs have also been inured to the mode of life, and the general system is robust, and every part is capable of promptly returning the circulation to the surface when it is thrown inwardly by any influence. Such persons, therefore, will not suffer from exposure except under rare circumstances; and will endure with impunity, or even luxuriate and feel hearty in, breeze and temperature that would be almost or quite fatal to less hardy people.

Persons accustomed to in-door life are much more sensitive to changes than those just named. So are delicate and slender people, and those who have been reduced in general strength by illness or by age. In all these classes, the resistive power at the surface is small, and the ability to repel a sudden influx of blood is limited. A brief and moderate chilling with them, therefore, is very liable to cause severe trouble. Usually they can trace their colds to some palpable occasion; yet these people sometimes are so susceptible, and so greatly increase their sensitiveness by cosying and over-heating in their rooms, that they are a large portion of their time afflicted with a cold, yet continually declaring that they "don't know how they caught it." An open window, an open door, standing on a porch a few minutes, a brief chat with a friend on the street, and the work is done. Ladies going from a super-heated room to a cool room in their homes, frequently suffer a cold from the impressions of this change.

Danger from these sources is increased by stillness. So long as a person is in fair motion, or making good muscular exertion of any kind, the blood-current of the entire body is hurried in proportion to the degree of exertion; and while this goes on, the

liability to contract a cold is diminished greatly, even under exposure. But a person sitting still or lying down has a lowered circulation, and therefore cannot endure any such degree of coldness as a person of the same general strength who is in action. And a person who has been in action, as working or walking, will find his susceptibility to cold increased quickly so soon as he stops the exertion. One coming in from a walk, and sitting down in a little draught by the door or a window, or stopping on a breezy street-corner to talk with a friend or to wait for a car, may be chilled on the surface in a few moments and begin "a cold" in a very little while. Thoughtlessness in such little things as these is the foundation for large numbers of these troubles.

The removal of a wrap or a coat while a little warmed from exertion, instead of waiting in the garment till properly cooled off, is another prolific cause of such dangers. Many an unwise woman has reached her grave by going out from a warm room into a cold and damp air in clothing that was insufficient. A sudden pneumonia, or a bronchitis followed by hasty consumption, is the result. The late Chief Justice Waite met his death by walking home from a party in thin dress, his carriage having been placed at the service of another person. Many are quite thoughtless in these small matters, and do not suspect harm till overtaken. Others are foolhardy, and boast their indifference to such trifles, till brought thereby face to face with death. It is a proper attention to these trifles, and due regard to surface protection under just such circumstances, that will save thousands from the dangers of a cold.

Each person must exercise his judgment, according to the circumstances in which he is placed; and while simple coddling weakens the outer tissues by too continuous warmth, and calls for some common sense in the way of inuring one's surface to less artificial heat, attempts to "harden" the system by means of chilling exposures are without good sense. Some remarks on this subject have been given already (p. 149).

Quite a different way of taking cold, is that of coming suddenly into a room that is too warm. A person who has been out of doors on a quite cold day, and comes into a heated room, is almost certain to hasten up to the fire to warm himself. Perhaps he begins to sneeze in a few minutes, and ends by catching a cold in his head, which he attributes to the out-door exposure. The simple facts are, that the cold out-door air had gradually constricted and condensed the mucous membrane lining the nostrils and upper

air-passages, diminishing the amount of blood in these parts; and then the sudden change to a heated atmosphere relaxed these membranes, when immediately the blood rushed to them in large quantities and dilated them—establishing the essential conditions of a cold. Very many such cases occur. With some persons it does not require a rough out-door exposure to produce a cold in this way. They are healthy, but sensitive, and mainly lead an in-door life. Going from a warm room to a cooler one and then returning to the hotter room, getting too close to a stove or the register of a furnace, and similar changes in the temperature from cool to too warm, and they have a cold. Some persons first realize that the room they are in is getting too hot, by beginning to sneeze. Colds taken in this way are not serious, but are quite annoying; and some ladies who remain much in-doors are troubled with them the entire winter, simply because they keep their chief rooms too warm and thus maintain a continued state of catarrhal engorgement in the mucous membranes.

Little children are not unfrequently made the helpless sufferers from over-warmth. Too frequently they are the victims of insufficient care, needlessly exposed, too thinly clad, too heavily clad over one portion of the body while almost naked over other portions, etc. With advancing information on these subjects, parents have of late years become much more judicious than formerly in the care of their children. But while errors of thoughtlessness and neglect and the cruel “hardening” philosophy are still too common, an opposite error of over-heating in the excess of parental tenderness is many times fallen into. In the kindly fear lest a cold may be taken, the child is kept entirely too warm,—thereby relaxing the surface, making it too susceptible to slight changes, opening the pores too freely, and thus helping on the very thing that is feared. The rooms are kept too hot (p. 33), too little fresh and cool air is allowed to enter, the child is forbidden to go near a closed window for a little of the cool freshening it craves, and is permitted to go out-of-doors too seldom. Especially is there a tendency to keep these children too warm in bed,—to lie them down in rooms quite above what the temperature of a sleeping room should be (p. 34), and then to cover them too heavily. The result is a soft skin and presently a more or less distinct perspiration. Soon the little one begins to toss about and kick; the anxious mother tucks it in again and complains that she never can keep the bed-clothes on that child; and this kind of a fight goes on till the mother goes to bed

and the heat of the room falls to a proper point far on in the night. At this time the child has again managed to get off most of the covering, presently becomes chilled, perhaps alarms the parents with some croupy cough, and wakes up in the morning with a cold. If the child had been put in a room of reasonable warmth, and not covered beyond the degree of gentle protection that it seemed to enjoy best, all this restlessness, worriment and danger would have been avoided. In regulating the warmth of a child's body, there is need for more intelligence than the Irish girl displayed when her mistress told her to make no mistake about the thermometer when washing the baby. "What good is the thermometer," said Bridget, "when I know all about bathing babies without it? Ev the baby gits red, the wather is too hot; and ev it gits blue, the wather is too cowld."

Colds are sometimes contracted in summer weather. A person may do this in very many ways,—as by being in a free perspiration from a little exertion and then sitting in a brisk draft and checking the perspiration suddenly; by falling asleep in a current of air which changes temperature suddenly during the night; by going into a cold cellar or milk house while heated, as women in the country often do, and remaining there too long. Such occurrences as that last named are entirely too common, and farmers' wives and daughters are frequently brought into serious danger by them and many times die because of them. A cold taken in summer weather is usually very severe and protracted; simply because the general surface warmth then becomes so great, that the influences which chill it cause a large and sudden fall in its temperature.

Millions of colds contracted each year, are trifling affairs and with but little inconvenience and no danger. But many thousands of them are decidedly severe and become exceedingly dangerous. No one can answer for what a sudden cold will do with him. The most vigorous may unexpectedly rush into a pneumonia, and be dead within a week; the young and the delicate may fall into a bronchitis or a pleurisy, and end in a consumption. The man or woman who neglects or trifles with a cold, and considers it a small matter that may be left to get well of itself, is making a mistake in too many instances. If perfectly simple, so much the better; it can be ended with little trouble and all danger be averted. But it is not at all an easy thing to tell how severe may be the course of any cold; or how suddenly, from an almost imperceptible influence, a trifling cold may dash into conditions of the greatest gravity.

Prompt and judicious care is immensely profitable in all such cases; but the consequences of neglect and trifling may be realized too late. With little children, the dangers of delay are especially sudden and serious.

The treatment of the different forms of cold will be given in other chapters, but some general facts in the management of all of them will be given here.

Do not go into a room that is too warm, a temperature of 68° to 70° F., being preferable to any greater heat, even in winter (p. 33). If this does not relieve any shivering sensations, do not attempt to remedy these by hotter firing, which will be certain to resolve a possibly light attack into a severe one. Secure a restoration of warmth by other means, as will be mentioned presently. Keep out of the line of any draughts in the room, yet be careful to supply the room with a good amount of fresh air as directed in the chapter on Ventilation. If the air in the room is dry, be sure to provide a little moisture (p. 37).

The chilliness and shivering which so frequently usher in a cold, come in large part from the great disturbance in the blood circulation of the capillary vessels, and in part from the impression of cold upon the nervous system distributed upon the surface. It is generally forgotten that the nerves have anything to do with chilliness; but they play a very important part in any and every form of chill, the sensation of shivering is always one of nerve impression, and the nerves are always more or less depressed when one has taken a cold.

Promptly to meet and overcome the chilliness and depression are first objects. If these can be removed quickly, the threatened danger may be averted effectually. It is right here that energy and thoroughness are most profitable. Put the feet in a vessel of quite warm water, lave it well up the limbs, and add to it every few minutes of water to keep it as hot as can well be borne. Such a foot bath should be continued from ten to twenty minutes, or even longer.

At the same time use a good stimulating and sweating drink, taking it quite as warm as it can well be used. This is necessary to arouse and diffuse the general circulation; and until such a drink is used freely, the person may shiver more than before so soon as he puts his feet in the hot water, or feel colder upon entering a warm room than he did previous to coming in. There is an almost endless variety of such warming drinks. A thoroughly hot

'lemonade, spiced with ginger and a little nutmeg, is excellent and may be drank bounteously. An infusion of ginger is among the best, and need not be made too strong; and a trifle of nutmeg, or a mere sniff of cayenne pepper may be added to it. Balm, sage, pennyroyal, thyme, are all suitable for such drinks, especially if not made too strong. The Sweating Powder of this book is a valuable formula. Vigorous people prefer to use Composition, and it certainly is a grand preparation for all needs of this kind. In mild chilliness, a little compound tincture of myrrh in a glass of hot water, with a little sugar, is a good article to use.

It is a good plan to sip a large cup of such an infusion during the time occupied in taking the foot bath. Then lie down and cover up pretty snugly, put a hot jug or bottle at the feet, and drink a cup or less of the hot infusion every half hour till a gentle moisture starts; when the amount may be moderated very much, and continued at intervals according to circumstances. Quite mild cases, especially among children and women who are mostly indoors, scarcely need the foot bath, unless the feet are found to be decidedly too cool. And these will find the Cold Powder, named in the latter part of this volume, to be a suitable preparation, using two or three tablespoonfuls every hour or oftener.

An ordinary cold should have from two to four days of housing and good care, and more in bad cases. Business men are not often willing to "lay by" thus for what they look upon as a small matter; and in their haste to get back to their affairs, not unfrequently secure to themselves a rough spell of sickness.

The bowels should always be moved freely during a cold. It is a very common thing for them to become suddenly constipated as a direct result of the disturbed circulation; or for the liver to suffer a measure of congestion or biliousness to result. Until pretty free evacuations have been obtained, it may prove no easy thing to break up the cold effectually. A large dose of castor oil is an old family physic in colds, and a thoroughly proper one to those who care to take it. Powdered magnesia, senna by infusion or syrup, the anti-bilious physic, all are suitable. The physic used should be of a character to act somewhat promptly, as do any of the above, when it is to be given during the middle or early part of the day. If given in the evening, it should be of a kind to act slowly, as the leptandrin pills or butternut syrup; for it would be awkward, in cold weather, to have these patients disturbed during the night and while in a probable moisture. The physic should

always be given in some excess of the average dose. Saline purges—as Epsom salts, Rochelle salts, Glauber's salts, citrate of magnesia, seltzer, etc. are not suitable for colds with chilliness.

It is an old axiom to "feed a cold"; but like a great many other old axioms it is a very decided mistake. A person with a cold should always eat moderately of light and easily digested foods, in form of soups and broths to a considerable extent, with no very cold drinks and no coffee.

CHAPTER LXI.

COLD IN THE HEAD. ACUTE CATARRH. CORYZA.

"A cold in the head" is a quite variable affection, in most instances causing but a few days of trifling inconvenience, in others causing general disturbance and annoyance. Some persons, by their modes of life, as mentioned in the preceding chapter, are exceedingly prone to it; and its frequent repetition becomes exceedingly unpleasant, giving a strong inclination toward chronic catarrh. With nursing children this kind of a cold will stop up the nostrils and prevent breathing through them; and as a little child knows nothing of breathing through the mouth, it causes much restlessness, and the discharges are liable to gravitate into the bronchial tubes, causing severe trouble there and possibly endangering sudden suffocation. Fleshy babes with such a catarrhal cold, have had the air-passages so completely filled by the abundant discharges during sleep, as to awake in a struggle and strangle to death in a few minutes.

Symptoms.—A cold of this kind usually begins with a feeling of dryness, fullness and tickling in the nostrils, and repeated sneezing. Sometimes these are preceded and accompanied by slight feelings of chilliness, sensitiveness to cool air, and a feeling of tightness across the forehead just above the eyes. The membranes of the nostrils presently become red and swollen; and soon there is a discharge of a thin and colorless fluid that is irritating, and which in a little time becomes very tenacious, and finally gets opaque or yellow. Sneezing may continue, the swollen state of the membranes nearly or completely closes the nasal passages, the eyes become red and watery, the acrid discharge and frequent

blowing of the nose lead to soreness about the wings of the nostrils, and the sense of smell is mostly lost and that of taste partially.

Such is the common history of light cases, with variations in degrees. More severe cases include swelling of the membranes beyond the direct nasal passages, and increase the number and severity of the bad feelings. The tight feeling across the forehead may increase, and become a dull pain. Soreness of the throat and changes in the voice follow if the trouble extend downward, as it probably will. Slight or considerable hardness of hearing may ensue, if the swelling close the air-tubes from the middle ear which opens just behind the nasal passages in the throat. The ducts which carry away the moisture and tears from the eyes get narrowed or closed, and the eyes are watery or the tears overflow on the checks. Some persons have the entire nose swell and get red, as in an erysipelas. Sharp pains may extend through the nerves of the cheeks, or settle in the teeth. The blood settles in the weak and distended vessels of the passages, and gravitates from side to side as the patient turns, causing most stuffing and stoppage in that nostril which is undermost, and freeing a large quantity of mucus at each such change of position.

Where coryza is so great as to close the nostrils and compel breathing by the mouth, it is a source of much annoyance in causing dryness of the mouth and throat. Cold air then breathed directly into the bronchi is quite likely to lead to bronchial catarrh; and some persons never suffer a cold in the head without its appearing to travel from the head downward to the lungs, ending with a sharp bronchitis, cough, and expectoration of pus and mucus. These cases give more or less feverishness and loss of appetite.

When a babe with such a cold attempts to nurse, it cannot breathe through either the mouth or nose; and so begins to strangle and turn purple, and is compelled to drop the breast. When it sleeps, the tongue naturally falls toward the throat and makes breathing difficult. Between interrupted nursing on the one hand, and interrupted breathing on the other, the child rapidly loses strength and is in danger of acute bronchitis. Sometimes a babe has a very tough exudation clog up the nasal passages so completely as to appear like a half-membranous substance in them; and this is liable to become foetid, and may be a cause of serious trouble or even prove fatal.

A cold in the head usually lasts from three to seven days, causing annoyance during this time but usually passing off without other inconvenience than a slight bronchial soreness. Persons leading a sedentary life in very warm rooms are liable to a succession of such attacks; and thus pass the entire fall and winter in a state of annoyance, and become subject to a nasal tone of voice, chronic catarrh, and gradually increasing bronchial troubles. The usual symptoms of coryza are, in greater or less severity, part of the history of measles, hay fever, and occasionally of other acute fevers.

Treatment.—Light cases require no treatment beyond proper housing, a regulation of the temperature and moisture of the room, and a mild cathartic of magnesia or anti-bilious physic. In more severe cases, and with persons liable to have this cold end in bronchitis, it is always advisable to manage it with care. The fact that a coryza is likely to last four days, "anyhow," should not be allowed to dictate a do-nothing course. Reduce the diet promptly, give a pretty warm foot bath morning and evening, give a slow physic at bed-time (p. 406), have the room of fair temperature and suitably ventilated, lie with the head a little raised and the body not too heavily covered. A pretty hot lemonade may be drank three or four times a day, or any of the mild diaphoretics named in the last chapter.

At moderate intervals, use a small quantity of some mildly astringent powder as a snuff, such as wild cherry bark, witch-hazle or beth root. If the discharges become tenacious so as not to be discharged easily, add one part of powdered borax to four parts of the astringent powder until the discharges become free; and then omit the borax. Borax is also good when the discharges are offensive; and so is a very little powdered myrrh in the other articles used. Powdered Peruvian bark makes a good snuff in bad cases. If the irritation of the nostrils is too great to use a snuff, they may be anointed with some vaseline or cold-cream ointment; and the odor sniffed from a few grains of camphor gum in a drachm of oil of spearmint. Oil or goose grease may be rubbed across the upper part of the nose several times a day. A thin covering may be worn upon the head.

Coryza in nursing children may demand that they be fed with a spoon, lest they should suffer for lack of nourishment. A child should always lie with its head pretty well elevated and have the bridge of the nose kept thoroughly oiled. If the mucus is abun-

dant and loose, the child should be laid upon its side, and be closely watched for fear of strangulation ; and quickly turned upon its face with the head dropped low, if signs of strangulation occur. If the nostrils get closed by tenacious and hardened secretions, a little powdered borax may be blown into them from time to time, and the secretions carefully removed ; after which they should be anointed with oil or cold cream by means of a feather or a camel's-hair brush.

If signs of mild bronchitis appear, such as a sense of rawness in the throat and hoarseness with cough, a little licorice may be used, or candy of hoarhound eaten ; and the syrup of cherry used every hour or two.

Persons who have become habituated to cold in the head, will find the nasal membranes very sensitive. During the winter months, they will do well to protect the head lightly, as by a single layer of silk in form of a cap ; and *gradually* accustom themselves to a moderately low temperature in their rooms (65° to 68° F.) and to being out-of-doors every day. A good "toughening" process for such people is a daily cold bath to the head and back of the neck, begun in warm weather and then continued through the winter.

CHAPTER LXII.

CHRONIC NASAL CATARRH. OZÆNA.

An acute catarrh, frequently renewed, leading to a weakened condition of the nasal mucous membranes, gradually develops into a chronic catarrh. This is quite likely to occur in the middle latitudes, where the sudden and extreme changes of weather during the winter months are very trying to the air-passages. Inhabitants of cities probably suffer in greatest numbers ; and locations where dampness of the air is very considerable, are its favorite haunts,—as by rivers and lakes. In higher positions it is less common. Robust and healthy persons may suffer from it ; but the feeble and those with dyspeptic conditions are most frequently the sufferers, while the scrofulous and cachectic present it in its severest forms. It is aggravated materially during the fall and winter months, gradually abates during the spring, almost disap-

pears in summer, and returns again next winter unless pretty successfully combatted in the warm months. Years may be occupied in thus establishing a real catarrh.

Symptoms.—The symptoms of catarrh differ according to the stage of the disease and the conditions present; and some cases may advance so slowly as to occupy many years in reaching a stage that others reach in a couple of years, and some remain always so mild as never to reach even the verge of the degenerate conditions. One class of cases present an increase of the secretions of the nostrils, and are called "moist catarrh;" while another class give no such increase, but possibly a distinct diminution of the secretions, and are called "dry catarrh."

The discharge that is present is thick, glairy or whitish, becoming opaque, not often abundant but rather scanty, and exceedingly tenacious. At the same time the lining membrane of the nostrils is swollen and slightly inflamed; and this, with the viscid secretion, narrows the passages, gives a certain "stuffiness" to the breathing, and imparts more or less nasal twang to the voice. If these conditions exist far back in the nostrils, the secretion is likely to gravitate into the throat and cause the same diseased conditions there. As the person lies down, especially upon his back, this glutinous material may drop into the throat; and it commonly, if pretty abundant, finds its way into the stomach, causing disgust and establishing disease there.

These conditions and symptoms may continue for many years, with varying degrees of the summer and winter fluctuations already alluded to. The discharge is always inclined to become offensive, at times quite so; and its disturbance of the stomach and of digestion is often great. Finding its way into the bronchial passages, it establishes in time a very persistent bronchitis and cough, which slowly reduce the person; and it is a popular belief that the moist forms of catarrh are causes of catarrhal consumption, though it would probably be more correct to say that certain persons disposed to throat consumption will nearly always first develop chronic catarrh.

After a time, the catarrh getting into worse conditions, the mucous membranes become pale and thin, or at times enormously swollen; the secretion slowly diminishes and gets very offensive, sensibility is diminished, there is more or less loss of smell, and impaired hearing, and presently the discharge dries into crusts in the passages. These crusts may be situated in the middle pas-

sages; or so far back in the nostrils as to be loosened and dislodged into the throat with some unpleasant and nauseating efforts. They are hard, roundish, half an inch or less in diameter, greenish-yellow in color, and give an unbearable offensiveness to the breath,—making the sufferer thoroughly repellent to his friends, though his own sense of smell is so diminished that he is wholly unconscious of the objectionable odor. It is at this disgusting stage called Ozæna. Such a person will be much reduced in general health and strength, emaciated, pale or straw-yellow, with deranged appetite and digestion, thin and impoverished in blood, dry and chaffy on the skin, and decidedly on the down-hill side. Should the case occur in one of a scrofulous constitution, or unfortunately tainted with constitutional poisoning, the ozæna will assume its most intractable forms; and some derangement of the constitution is the cause of most of these severer forms.

At this advanced stage, the slow impairment of the strength, together with a poisoned and ulcerous condition of the lungs from inhaling the foul odors and of the stomach from swallowing the corrupt material, a patient may sink gradually and die. But ulcers may also form under the crusts, giving a little pus and blood on these when discharged; and the bones beneath them may become diseased and portions rot away; and pus may accumulate in the cavity of the cheek bones and cause intense suffering. Yet some persons *may* recover from even these conditions, after a long time; and a chronic nasal catarrh is rarely fatal except in those very much enfeebled in their constitutional condition,—and then only after long years and in advancing life.

Treatment.—This must vary according to the stage and conditions. It is always advisable to promote a dislodgment of the secretions with a thorough cleansing of the passages, so that discharges may not become offensive by their retention; their offensiveness must be mitigated as much as possible, and the parts restored to their healthy tone. At the same time the general health must be sustained by the best possible hygiene, good tonics to promote the tone of the stomach, thorough purifying syrups for the scrofulous, and an out-door life as far as possible with proper caution against the causes of cold. It is useless to attempt to cure any advanced case by merely local appliances, though these are themselves invaluable; and, while the great majority of cases do not get beyond an annoying constancy of mucous discharge, the need of constitutional invigoration and purification is demanded in every

instance when the grosser symptoms are present. The purifying and toning remedies advised for scrofula, are the proper ones.

Medicaments may be employed in the form of snuffs, by the douche, or in spray. The douche consists of a vessel containing the medicine in fluid form, held or suspended over the patient's head; with a small rubber tube, and at the lower end of the tube a nozzle that fits into the opening of the nostril. The fluid enters one nostril through this tube, and passes out of the other into a vessel. When used, the person must stand erect, avoid any forward inclination of the head, open the mouth and breathe entirely through it, and not make the least attempt at swallowing. Should he swallow while the fluid is passing through, some of this will almost inevitably rush into the opening of the tube that supplies the inner ear with air (Eustachian tube), and severe trouble to the ear will result. The douche effectually washes out and cleanses the floor of the nostrils, for which purpose it is of great advantage; but it cannot reach the upper parts and the roof of the passages. It is generally used once a day, mostly in the morning; but may also be used in the evening, in bad cases.

Snuffs have an advantage in reaching the upper parts of the nostrils, and clinging to the membrane so as to make their action somewhat prolonged. They can also be carried by the person to his business, and used as frequently as he may find advisable,—which is generally every hour or two. They should always be in exceedingly fine powder, and used in moderate quantities at each insufflation.

Spraying the nostrils by a small hand atomizer, is an excellent means of reaching the roof and other remote portions of the nares, as the fluid in this form of mist can be made to touch every part and every depression. An instrument that will give a very fine and a continuous spray, is the only suitable one to use. Of these there are many good forms; but the exceedingly small atomizers are of no value, although very cheap. Spraying is usually practiced twice a day, but may be employed oftener; and a suitable snuff may be used between.

A good snuff may be made of golden seal four parts, wild cherry bark eight parts, and borax one to two parts. Borax keeps the secretions from hardening and hastens their discharge, being at the same time a moderate antiseptic and preventor of offensiveness; and the amount of it may be increased when the catarrh is of the dry class. If the case is especially moist, borax may be omitted

and four parts of witchhazel added to the other ingredients; or two parts of the cranesbill. When the lining membrane is greatly swollen, a decided astringent is needed with a tonic, as one part of tannin, two parts cranesbill and four parts of golden seal. A very little bayberry may be added to any of these snuffs, when the parts are not sensitive; and a quite small portion of gum myrrh, with golden seal and borax, is a fine article when the discharges become offensive. A snuff should not be drawn into the nostrils with too much force, lest it cause unpleasant sensations in the head by reaching the hollows of the bones along the eye-brows, and by lodging there cause solid accumulations.

In the douche, common table salt in tepid water—a teaspoonful to a pint—is a suitable cleansing and disinfectant article, and is more employed than any other agent. Borax, at the rate of half a teaspoonful to the pint, is another good medicament. Either of these may be put into a very weak infusion of golden seal or of scullcap; and one or two teaspoonsfuls of glycerine may be added to advantage. All douches are best employed at a tepid warmth, though sometimes a person seems to prefer them cold.

Any of the articles used in snuffs or douches may be used in the spray, making them into weak infusions or solutions. Myrrh cannot be used in this way, being a resin and therefore insoluble. For disinfectant purposes by the spray, a solution of table salt is proper, adding a little glycerine. In very bad cases, two to five grains of permanganate of potassa in four ounces of water will make a good antiseptic; and in half an hour after using this to purify the passages, it may be followed with a spray of golden seal and borax. I am partial to making this latter of half a grain hydrastis sulphate and four grains of borax to an ounce of water. If the discharges are very abundant after using the potassa permanganate, the subsequent spray may contain five grains of alum to the ounce with half a grain hydrastis sulphate. The spray, used morning and evening, may in half an hour be followed by the douche to cleanse away the loosened materials that have settled to the floor of the nostrils; and then a suitable snuff used during the day. I believe it will be found advisable not to use washes and sprays through these passages too frequently in a day.

I am not at all partial to carbolic acid in solution or any other form, though a common article with many. It is not nearly so good an antiseptic as it is supposed to be, and eventually damages the membranes. Sometimes I have found it useful to fill a small

vial loosely with cotton, and saturate this with some of the essential oils, directing the patient to sniff the odor of these several times a day. I like a combination of ten parts oil of sassafras and one part oil of wintergreen, both of which are antiseptic, but if the case is moist add two parts oil of cinnamon, and if dry add two to four parts oil of origanum.

To cure a catarrh of this kind in the sense that other maladies are cured, is a proposition rarely fulfilled in our changeable climate. It may be held in check very decidedly, and improved to such a degree as to cause almost no trouble except for a little time in winter; and yet it is exceedingly prone to return with cold and rough weather. But this fact does not lessen the importance of steadily combatting the annoyance and keeping it down to a mild form, lest it suddenly assume serious grades and jeopardize the general health. It will be advisable for these patients to seek a home in some dry position, before their malady reaches a too advanced stage. They should get away from ocean, lakes, rivers and humid valleys; and go to some high location where the atmosphere is comparatively dry and the climate not severely changeable.

CHAPTER LXIII.

INFLUENZA. EPIDEMIC CATARRH.

THIS is a form of catarrh which sometimes appears as an epidemic, attacking large numbers of people without regard to exposure and almost simultaneously. Its simple form resembles a common "cold in the head" with some bronchial catarrh, but gives more throat soreness and general loss of strength. In the severe and epidemic form it has been called *Catarrhal Fever*, and is gravely prostrating and liable to cause severe complications in the form of acute bronchitis, pneumonia, jaundice, stomach troubles, etc. It is seldom fatal to the robust, but is often so among the aged and feeble.

Symptoms.—Begins suddenly, with coldness down the back, then chilliness and shivering, followed by flushes of heat, headache, pains through the chest and limbs, and sense of prostration. Soon there are fever, very rapid pulse, hurried breathing, soreness of the throat, and "raw feelings" extending from the larynx quite down the trachea and into the chest, short and irritable cough with a

little glairy expectoration, urine scanty and muddy. Distressing headache over the eye-brows and into the eye-balls, increased severely by coughing; tongue red at the tips and sides, dusky fur over the surface, sometimes entirely red. After two or three days, the skin heat becomes less but the pulse may be 120 to 140, tongue inclined to brown or glaze, breathing much faster, cough very frequent, expectoration yellowish, face flushed purplish or livid, prostration marked, possibly some delirium. Some cases give nausea and vomiting, distinct jaundice, rheumatic pains through different parts, and sharp signs of bronchitis. Average cases begin to yield from the third to the seventh day. Very severe cases continue several days more, with cold hands and feet, difficult breathing, often causing the patient to sit up in bed and struggle for breath, rattling in the chest, face livid and eyes prominent, probably dry scales on the tongue and teeth.

Improvement is signified by easier and slower breathing, warm hands and feet, less irritating cough, larger and free whitish-yellow expectoration, abatement of headache and other pains. Dangerous cases give cold sweating, cool or cold body with very rapid pulse, distressing and ineffectual coughing, then profuse and heavy yellow or bloody expectoration, and great prostration with sinkings. In recovery, the cough and lung secretions gradually lessen, appetite returns, but strength is regained very slowly; and during convalescence there may be short returns of labored breathing and sharp rheumatic pains.

Treatment.—House the patient well, give warm foot baths with salt and a little mustard or cayenne pepper every twelve hours, give the Sweating Powder or some similar diaphoretic as in common colds, use the Nervine Liniment over the chest every six or four hours, and down the throat when sore. Move the bowels gently with rhubarb and senna syrup, or a compound leptandrin pill. For the cough, use the Cherry and Spikenard syrup. When the fever abates and nerve prostration begins, use little or none of the sweating drink, but give such a tonic as the Nervine Tonic by infusion, warm and rather freely, every three or two hours; use the Compound Spikenard syrup, or the Hoarhound Cough Syrup for the cough; and apply the Stimulating Liniment over the chest and along the spine. Keep up good tonic treatment till the strength is restored; and guard aged and feeble persons against neglect or exposure.

CHAPTER LXIV.

ASTHMA. SPASMODIC ASTHMA. PHTHISIC.

ASTHMA is a spasmodic form of difficult breathing without fever, and generally has a nervous origin. A similar difficulty occurs in certain forms of heart disease, and in some cases of consumption, as will be mentioned at the proper places. In this chapter the spasmodic form of the difficulty, or asthma proper, is the one considered.

Symptoms.—Paroxysms of asthma mostly occur during the night, and chiefly after midnight; but may come on at other times. It often gives warning of an approaching attack by a variety of nervous symptoms, among which are irritability, chilliness, languor, drowsiness, flatulence, itching under the chin or along the sternum, aches in the limbs, neuralgic pains, etc. Persons who have been afflicted, generally notice one or another of such feelings, and from them correctly conclude that they will have a bad night of it.

The attack usually comes on suddenly, perhaps waking the person out of his sleep. At once there begins a struggle to get air into the lungs, the desire to draw in a full breath being intense but the chest refusing to expand, and the patient feeling that it is impossible to make the air penetrate below a certain superficial point. Sitting up at once in bed, or getting out upon a chair, he draws up his knees and plants the elbows upon them, stoops the shoulders forward, throws the head back a little, perhaps supports the chin upon the hands, and begins the struggle for breath. Or perhaps he stands leaning over the back of a chair, or against a bureau, or crawls to the open door or window and stays there for hours, even in cold weather, dreading to move and caring only for air. Breathing is not hurried, indeed it may be a trifle slower than natural; but the limited amount of air inspired passes in with a distressful wheezing, and is forced out with a similar sound.

During the attack the eyes are thrust forward some; the face is puffed and dusky in mild cases, pale or blue in severe ones; the hands and feet become cold and shrivelled; a cold perspiration starts upon the face in great beads; the pulse is small and feeble; and the patient is a pitiable object of distress. The attack often passes off suddenly, a discharge of a little tenacious mucus seeming to give immediate relief and the patient soon falling asleep.

Confirmed asthmatics are usually pallid, with hollow cheeks, prominent eyes, a peculiar expression of distress, and carrying the head as if somewhat settled down between the shoulders. They are short-winded, have a little rattling cough and wheezing much of the time, and are quite inclined to disturbances of digestion.

Such paroxysms may return many nights in succession, and then disappear for weeks or months. In some persons they return at certain seasons. A limited number have prolonged paroxysms for days together, almost without remission. Some situations favor it with many persons, as a city residence and night air; while others enjoy relief in the same locality, and thrive on city smoke and fog. Various odors incite it with some people, as the smell of violets, roses, coffee, etc. One dyer had an attack whenever he used yellow oak; a florist suffered when he smelled lamp-black; a druggist's wife always suffered when her husband handled ipecac, even though she were in the third story and well shut off from the shop. Dusts of various kinds are quite likely to start a paroxysm; and ill health in other organs will often prove its provoking cause, as disorder of the stomach, an acute catarrh, worms, female diseases; and also some foods are found to be promotive of asthmatic paroxysms. Such facts illustrate the thoroughly nervous character of the trouble,—nervous impressions causing spasmodic narrowing of the air-passages, and then further and permanent narrowing by a thickened condition of their lining membrane.

Asthmatic breathing caused by heart disease is panting and gasping, without the labor and distress of this spasmodic asthma; and it always is accompanied with marked disturbance of the heart and pulse, in which again it differs from spasmodic asthma. It is important to note these facts; and not to mistake the difficult breathing of heart disease for spasmodic asthma, as the two maladies require quite different treatment. A strained and dilated condition of the air vesicles gives difficulty of breathing known as emphysema; but the description of this malady in another chapter shows how unlike it is to spasmodic asthma.

Asthma is rarely or never fatal, enduring for a long life without fatal results. But its repeated attacks make life miserable; and in many cases it at last involves the heart and lungs in changes that may be serious. After years of distress, it establishes a nearly continuous cough with abundant tenacious expectoration; more or less difficulty of breathing whenever the sufferer lies down; and at last an inefficient lung power that fails to aerate the blood.

Treatment.—During a paroxysm, loosen all clothing about the chest and abdomen, and supply plenty of fresh air from an open window. Some preparation of lobelia will be found most serviceable of all articles in relieving the spasms; and with it should always be combined about one-eighth to one-fourth part of blue cohosh. Vinegar syrup of lobelia is an effective form with some; others prefer simple infusion. The doses should be large, and given every ten or five minutes till free nausea starts away the tenacious mucus; when the relief is likely to be great and the medicine may be reduced greatly. At the same time it may be of distinct benefit to many sufferers to fill the room moderately with the smoke from burning rosin weed, mullein, or camomile, or from a combination of these. Such a smoky atmosphere seems peculiarly grateful to many, but proves objectionable to others. Such measures are all that can be brought to bear during the paroxysms.

Hope of cure, when cure is possible, depends on what is done between the attacks. Any condition or disease that might by any possibility provoke them, must be searched out and removed, so that the entire body shall be brought into the most healthy condition possible. The liver, stomach and bowels must receive especial attention, and be kept properly toned and in good action. It will, with some, be of much importance to see that the kidneys are in a healthy state. In females, any signs of anæmia, chlorosis or hysteria must be met promptly. A plain diet, and one easy of digestion, is necessary; for hearty eating and rich foods keep the stomach and liver in a condition that actively favors asthmatic paroxysms. Some sections of country are peculiarly free from asthmatic troubles, and it is many times desirable for these patients to move to such a section. Much care must be taken with the clothing, ventilation, etc., so as to favor the most equable warmth of the surface and the best supply of fresh air.

In elderly and confirmed subjects, a cure is not to be hoped for; but by such a course as the above the paroxysms may be kept off a long time, and greatly lightened in severity. Many young and middle-aged subjects get well. Sometimes asthma is inherited, and is then peculiarly obstinate to all treatment if of a severe form.

CHAPTER LXV.

QUINSY. INFLAMMATION OF TONSILS.

THE tonsils are glands within the throat, on either side, just back of the arch of the palate. Acute inflammation of them occurs oftenest after puberty in early life, may also occur in young children, but is rare in advanced life. Some young persons are peculiarly liable to it, suffering it repeatedly, others are often full-blooded and hearty people, and those a little inclined to scrofula. It occurs chiefly during winter; and may be confined to one tonsil, or affect one after the other, or attack both tonsils simultaneously. It is a troublesome and painful malady, though in no sense dangerous; but in scrofulous children, where scarcely a winter passes without one or more attacks, it causes persistent tenderness of the throat and permanent enlargement of the glands.

Symptoms.—A considerable number of cases are quite simple, not extending deeply into the substance of the gland. In such, the symptoms consist of a stinging and sense of tightness or fullness in the throat; some trouble and feelings of stiffness in swallowing; dryness presently followed by an increase of mucus and saliva, which provokes repeated and rather painful swallowing; and a little pain and stiffness about the jaws. A trifling fever may be present, a headache, bad taste in the mouth, and loss of appetite. Children are restless, particularly at night. On looking into the throat, the palate and tonsils will be seen light red and a little swollen.

In more severe attacks, these symptoms are all much increased. Swallowing is quite difficult, the mouth can be opened but a little way and this with difficulty, the pain in the parts is more severe and generally shoots down the jaws or to the ears. A pretty sharp fever rises; the mouth is clammy, tongue heavily furred, appetite lost, breath unpleasant, and head aches. The voice is altered in its tone, and somewhat hoarse; often abundance of viscid mucus in the throat compels frequent and painful hawking to remove it. Looking into the throat by pressing down the tongue and drawing it a little forward with the handle of a spoon, at the same time directing the patient to draw in his breath, the parts will be found bright red, one or both tonsils greatly swollen, the passage of the throat nearly closed when both are swollen, and tenacious mucus covering them. Many times there will also be small yellowish spots on the swollen tonsils, over the mouth of the little open-

ings in these glands. Such spots are occasionally mistaken for diphtheric ulcers, and much alarm is consequently felt lest the patient has that serious malady; but the ulcers of diphtheria sink down like shallow saucers with the surrounding parts dusky red, but these yellowish spots of quinsy are upon the surface and not at all sunken, and the parts around are bright red.

Ordinary attacks last from three to four days; severe ones from five to eight days. There is a probability that severe cases may form one or more small abscesses, and these are prolonged ten or twelve days. The occurrence of an abscess usually begins by slight chilliness after three or four days of fever; and presently a smooth yellow spot is seen bulging under the surface. Suddenly, in two to four days after the chilliness, the abscess bursts and the patient is relieved in an instant.

Treatment.—In simple cases, let the patient keep in a room well warmed; move the bowels promptly with a full dose of anti-bilious physic and cream-of-tartar, or with magnesia citrates, and then keep them free with senna or rhubarb syrup; and let the patient suck quite small pieces of ice from time to time, gargling with a mild tea of sage at intervals. The bulk of a small bean of borax may be added to half a pint of this gargle; or tepid water and milk, with borax, may be used for gargling. It is advisable to protect the throat with a layer of flannel about the neck; and every three hours to bathe the throat, over the tonsils, with the Nervine Liniment. Swallowing is troublesome; so these patients can use but little medicine except an occasional portion of some such drink as flax-seed, balm, catnip, or similar mild infusion.

In more severe cases, the patient may inhale the steam rising from boiling water poured on camomile flowers, or sage leaves, or a few hemlock leaves, adding to the vessel a tablespoonful of vinegar. Such inhalations may be repeated every two hours or oftener. If the swelling is on both sides and interferes with the breathing, let the throat be sponged freely with a moderately strong infusion of cherry bark, witch-hazel leaves, or raspberry leaves, repeated every two hours. Some golden seal may be added to either of these. Gargles of these articles may also be used, with a very little borax added. Nervine Liniment is to be used freely on the throat, and the bowels kept well open—larger than average doses of physic being usually required, and Butternut Syrup being a very suitable article.

A nourishing and mostly fluid diet is to be given, as milk, ani-

mal broths, oyster soup, etc. Fever is of secondary consequence, and needs little attention beyond the drinks already named and proper freedom of the bowels. If, after the first few days, the patient seem languid and prostrated, a proper dose of Nervine Tonic, or similar tonic, should be given every three hours. During convalescence, it is well to strengthen the throat by gargling with infusion of oak bark, gum kino, or similar firm astringent; which usually has the effect of consolidating the tonsils so that annoying swellings may not remain. Children, if inclined to scrofula, will do well to use a tonic-alterative course of syrup, as directed under that malady, so as to improve the general system and prevent the liability to enlarged tonsils. Repetitions of these attacks are best prevented by daily gargles of golden seal or Peruvian bark, with a moderate amount of a good astringent, continued for a long time. If permanent enlargement of the tonsils remain, this is the better plan to pursue; but cutting them off is poor surgery, at the best.

CHAPTER LXVI.

FALLING OF THE PALATE.

AN acute cold affecting the throat, and inflammation of the upper part of the throat, may be accompanied and followed by a relaxed and drooping state of the palate and adjacent parts. Persons using the voice much, as singers and speakers, are liable to the same trouble; and if such vocal exertions are made forcibly during or soon after a cold, this weakening of the palate is pretty certain to follow. It troubles children and young people oftener than it does those in riper years.

The palate (uvula) and the columns of the palate by the sides of the opening into the throat become relaxed, slightly swollen, and somewhat pale; at the same time the muscles that hold up the palate get relaxed, and allow it to fall low down the throat. Between this elongation caused by the swelling, and the drooping caused by the relaxation, the palate touches upon the root of the tongue, and may hang quite down toward the larynx. In this position it seems as a foreign substance in the throat, provoking tickling and cough, often changing the voice a little. In ordinary cases these feelings are simply an inconvenience, and pass away in a few days without

any especial attention. In more severe cases the sensations are nearly constant, and become exceedingly annoying. Cough is troublesome and continuous—a short and annoying cough; not relieved by the usual cough syrups, without any especial expectoration, but with an almost unabated sense of tickling. Such cases may continue several days, or weeks. In a few instances, the tickling in the fauces may provoke nausea and an occasional inclination to vomit; or in some rare cases there may be actual vomiting at times, the cough is troublesome in the night as well as during the day, and the palate drops down so far during sleep as to cause spasm of the glottis and sudden awakening as if about to strangle. In these severe cases, which may be protracted for months, the patient loses appetite and becomes much reduced in flesh, looking almost like a consumptive. Persons inclined to consumption, or developing it, sometimes have this elongation of the palate among the earlier symptoms.

To judge whether the palate is too long and droops down, press the tongue down smoothly with the handle of a spoon or other flat thing, drawing it slightly forward so as to expose the opening of the throat. Then direct the person to breathe *outward* gently; for if he draw the breath *in*, this act will lift the palate up and its true length can not be judged. If it has fallen, it will be seen to rest quite down upon the root of the tongue; or its point may droop so far behind the tongue as not to be visible.

This trouble, though ever so annoying, is easily relieved unless there is a more serious throat trouble at the back of it. A good astringent is to be employed, mixed with some stimulant. Cherry bark, witch-hazel, cranesbill, kino, oak bark, or tannin, may be used as the astringent; and a small quantity of black pepper as the stimulant. Bayberry is both astringent and stimulant, and may be combined with cherry or any of the astringents. Such medicines may be used as fine powder, and applied several times a day, directly to the palate, by placing some on a knife blade or spoon handle and slipping this back over the tongue so as to bring the powder in direct contact with the palate. The patient should neither draw in the breath nor breathe out at the time of making the application. Gargles may be made of the same articles, but are not so good as the powders. Lozenges containing cherry bark, with a little prickly ash, golden seal and cinnamon, are good; and so is the old-fashioned candy known as butter-scotch, when there is added to it a good share of cinnamon and a slight sprinkle of cayenne.

CHAPTER LXVII.

ACUTE SORE THROAT.

QUITE a number of troubles are classed under the general title of Sore Throat, the part alluded to bring the pharynx or throat opening visible to the eye and behind the mouth. All affections there are liable to extend in some degree to the larynx or organs of voice, and thus to produce some measure of change in the voice itself; but they present their chief signs in the pharynx and about the tonsils, and sometimes scarcely affect the larynx at all.

Among the acute troubles of the throat are quinsy, diphtheria and scarlet fever; which have been spoken of in other chapters. Putrid sore throat is an ulcerating affection of great severity, in nearly every respect similar to diphtheria. Soreness and inflammation of these parts are common symptoms in small-pox, typhoid fever, and several other maladies; and the peculiar sensations caused by falling of the palate attract attention to the throat, although they are quite different from inflammation. But apart from all these, the throat may be inflamed or even ulcerated. Since diphtheria has become so frequent and severe as an epidemic in our country, it is fashionable to pronounce every little throat ailment as a case of that malady; and we sometimes hear people tell of having an attack of diphtheria every winter, or even two or three attacks in the course of a single winter, when in fact they have but suffered an ordinary sore throat from a trifling cold, and perhaps never had an attack of diphtheria. Diphtheria is altogether too serious a malady to be classed in this way; and if people deceive themselves thus in regard to it, they may make light of it when it really comes and lose a life by trifling. Men and woman should be honest with themselves in these matters, and call things by their right names.

Symptoms.—Slight cases provoke no general symptoms, but severe cases may be accompanied by chilliness, headache, flushed face, and some general fever. In the throat itself there are feelings of "rawness" or soreness, uneasiness, or actual pain; a sense of something being in the throat that continuously demands being swallowed or removed by hawking, which feeling is increased if the palate is involved so as to be swollen. Swallowing is unpleasant, or even painful; and a short throat-cough is troublesome, all the symptoms usually getting worse at night, or after sleeping. If

the trouble extend downward so as to implicate the larynx, there will be difficulty of breathing and hoarseness of voice according to the extent of inflammation and swelling in the larynx. Looking into the throat, it will be found light or bright-red, dry, glistening; at some parts swollen and quite light-colored; in very severe cases it may look dusky-red or even livid, and such colors are always of dangerous import.

In ordinary cases, a whitish-yellow secretion appears in patches over the throat and tonsils after a few days; this lies upon the surface and is easily removed, in which particulars it is quite unlike any form or degree of diphtheria. Many times, and the more so in persons whose throat has become weakened and sensitive by repeated attacks, the mucous coat of the parts will become more or less ulcerated in patches; but such ulcerations are not deep and give no sloughing membrane, as does diphtheria. Sometimes there will also be swelling and tenderness about the angles of the jaws. In general, an attack lasts from three to six days, and abates without other trouble, though its repetition leaves a tendency to renewed attacks on ordinary exposures. Repeated attacks may establish chronic sore throat, as will be described in another chapter. Severe and serious implications of the larynx will be spoken of in the chapter on Laryngitis.

Treatment.—In mild cases, it is usually sufficient to wear at night a wet compress about the throat, covering it with a dry band of muslin, give a dose of mild physic, and sip a tea of flaxseed and ginger during the day. In severe cases, the patient will need to rest in a warm room with the atmosphere kept slightly moist; use the flaxseed and ginger tea regularly till the inflammation subsides; and over the throat apply the Nervine Liniment every six or four hours, wearing a layer of flannel to protect the surface. At the same time let the bowels be kept free by syrup of senna, powdered magnesia, or similar physic. Gargling with a moderate infusion of cherry bark, or a weak infusion of sage having the bulk of a small bean of borax to the half pint, is desirable, and the more so if slight ulcers follow the inflammation. In some severe cases, the parts look pale after a few days, and are puffy and seem to be translucent about the palate, tonsils, etc. Such appearances following the bright redness of inflammation are caused by watery accumulations (dropsy, oedema) under the surface, and are signs of weakness in the parts. If the larynx is at all involved, the voice will be nearly lost in a sort of a hoarse whisper which is unpleasant

to listen to, but which may cause no distress whatever. In such conditions, withhold the flaxseed tea; use the Nervine Liniment on the outside very freely; and gargle every two hours or oftener with an astringing and toning preparation, such as infusion of dogwood bark, sumac bark, kino, oak bark, with golden seal added to either of them. The use of a stimulating lozenge will then be excellent, such as home-made "butter-scotch", or molasses candy containing some ginger and a sprinkle of cayenne pepper, or the preparation called Bread of Life in the formulary.

Inhalation of steam is sometimes the cause of such inflammation of the pharynx. Great swelling follows quickly, and the parts are strongly inclined to oedema, and then to become soft and slough off after a few days. In such cases, oils or mucilages must be applied to the parts at first; and the milder astringents used upon them in the form of spray after the bright color begins to fade, repeating every two hours. The patient must not be allowed to talk; and it will be necessary to use broths and other fluid foods, and sometimes it will be requisite to give the nourishment by the bowel.

CHAPTER LXVIII.

CHRONIC SORE THROAT.

IT is far more common to meet chronic inflammation and ulceration of the throat or pharynx, than to meet acute forms of these troubles. Such chronic diseases exist in a variety of degrees and forms, and are dependent on a variety of causes. As in acute inflammation, the larynx is liable to be involved at the same time and thus to cause marked changes in the voice.

In simple cases, the back of the throat is somewhat dull-red in patches, traversed by small veins that are slightly swollen, with intermediate portions that are slightly pale. Swelling is quite common, the surface tissues becoming thickened and looking roughened, and there being varied little prominences at the mouths of ducts that open into the pharynx. In some cases the membrane is a little moist; but much oftener it is rather dry and somewhat tense and shining, as if it had been touched with a thin coat of varnish.

In some cases of a more severe type, the pharynx has a sticky secretion on its surface; and this may dry into disgusting yellow

or greenish crust. The mouths of the little glands or follicles get choked up with a whitish-yellow secretion; and then burst, discharging a drop or two of offensive matter, and leaving small ulcerating depressions. Such appearances may be visible over patches of the pharynx, or over the whole of it.

Some cases follow a catarrh in the posterior nares, and become a part of this malady, extending into the larynx and bronchi. Very frequently these throat conditions are but intimations of the state of the stomach, being extensions of chronic inflammation and erosions of the latter organ. One form of this is seen among habitual tipplers, who suffer decided pharyngeal troubles when their drinking habits have injured the coats of the stomach. Persons who use excessively hot drinks at table, often injure stomach and throat by this habit; and one form of this ailment, known as "clergyman's sore throat," is due to taxing the voice by speaking soon after a hearty meal, as ministers frequently do.

The feelings connected with these chronic troubles are annoying and very persistent. A constant tickling is felt in the throat, causing a nearly constant effort to clear the throat by hawking, spitting, or occasionally coughing. Soreness and slight pain occur at times. The voice is at times slightly rough and muffled; in bad cases decidedly husky; becomes hoarse and almost lost when the larynx is involved, or nasal in its tone when the trouble extends upward into the posterior nostrils—the latter class of cases resembling a chronic nasal catarrh, and causing much hawking and straining in the morning to remove the tenacious secretion and harsh crusts that form during the night. In their duration, these troubles are very persistent—at times seeming about to recover and then suddenly returning with aggravated symptoms.

Treatment.—In all instances, the condition of the stomach and bowels must be regulated and improved; the diet made plain yet fully nourishing, and digestion promoted by suitable mild tonics. All spices are to be omitted, except the lightest seasoning; and every form of alcoholic stimulus rejected, though this class of persons are strongly inclined to resort to some measure of this kind. Clergymen and others of sedentary habits must secure a considerable share of out-door life, and pretty full and regular muscular exertion by gymnastics or otherwise, in order to relieve the nervous system and secure a good balance in the action of the body. Public speakers must be careful not to use the voice soon after a meal and while digestion is in progress. Muffling the throat unduly in

cool or cold weather will make it too tender and protract this difficulty; while gradually inuring it to considerable exposures, and daily bathing it with cold water, will be beneficial.

For medication, it is well to use as a spray a moderate infusion of some of the milder astringents, such as cherry bark, witch-hazel, or raspberry leaves; or sage with a little borax.

CHAPTER LXIX.

INFLAMMATION OF THE LARYNX.

THE region of the vocal organs (larynx) is subject to colds and inflammation on its mucous membrane, very often extending from the pharynx downward as described in another chapter. In many cases the trouble is superficial and comparatively trifling; while in other cases it is more deep and liable to become very serious. In all instances the voice is roughened and much changed; and it is not uncommon for such an inflammation to give symptoms strongly resembling croup. For a true croup involves the same structures; but is marked by a peculiar and dense thickening of the mucous membrane, while the simple inflammation I am here speaking of does not give this thickening. Adults are more liable to this inflammation than are children; and because of the hoarse voice and cough accompanying it, conclude that they have had repeated attacks of true croup.

Symptoms.—In simple cases, the symptoms are quite similar to those of a common cold involving the throat; with slight tickling or a feeling of heat and soreness in this region, a sense of dryness and tightness, and a little difficulty in swallowing. The voice gets more and more hoarse and rough, and finally becomes almost inaudible; there is a dry and husky cough; and speaking and coughing increase the soreness. Some trifling cases give no soreness or tenderness, though the voice gradually sinks to a rough whisper. In other cases the cough recurs in paroxysms, becomes shrill and croupal; and then gets husky and hollow, with annoying efforts to dislodge a tenacious accumulation in the larynx. Swelling of the tissues at the extreme root of the tongue causes a peculiar difficulty and sense of stiffness in swallowing, and at times there are brief spells of difficult breathing from a slight spasmodic closure of the

larynx. There may be some feverishness; in two or three days there is a glairy mucous expectoration, a peculiar sense of "rawness" follows, and the trouble ends in from four to seven days but may leave the voice somewhat husky.

In severer cases, when the deeper tissues are also inflamed, the attack is suddenly ushered in with chilliness and then decided fever. The face is flushed; hoarseness is decided and begins early; the sense of soreness is painful; a coarse and croupal cough increases the suffering, and soon becomes wheezing and barking. There is decided difficulty of swallowing; and in a couple of days considerable difficulty of breathing, with prolonged and wheezing inspiration, and a feeling of impending suffocation after a time.

In yet more severe cases, all these symptoms are farther aggravated; and what is generally a simple affection becomes an exceedingly serious malady. The patient is very restless. Face flushed and dusky, becoming pallid with dark bands under the protruding eyes. Breathing very difficult, the entire chest heaving in the distressing efforts to get breath. The countenance may next become ghastly, the pulse small and irregular, drowsiness supervene, and death follow in two to four days if relief is not obtained.

In some cases of this class, dropsy (œdema) occurs about the vocal cords. Or such dropsy may occur in cases where the local inflammation has been mild and the symptoms have not been severe, there being little fever or tenderness of the throat, but the difficulty of breathing advancing rapidly. Suddenly the patient declares he is choking, groans and dashes himself about in desperation, grows livid in the face and cold at the extremities, and may die in a few hours. Such œdema of the larynx is not common, and occurs in adults rather than in children. It may follow inflammation of the larynx from cold, or from the inhalation of steam or flames. Any form of this inflammation may extend to the bronchi and give a true bronchitis.

Treatment.—In simple cases, keep the patient in a warm room, move the bowels with antibilious physic or similar cathartic, give a hot foot-bath night and morning, have him take freely a tea of flaxseed containing a little licorice and a few drops of lemon or vinegar, and gargle with an infusion of wild cherry and a little borax. After the second day, an infusion of sage or raspberry, with borax, may be used for a gargle. The Nervine Liniment should be applied over the throat three or four times a day, and the neck protected with a layer of flannel. If the voice is mostly lost,

especially after the second day, some mildly stimulating preparation must be used, as has been directed in Chapter LXVII.

When the case is very severe and liable to become dangerous, a much more vigorous plan must be followed. Swallowing may be so difficult as to make it necessary to employ an atomizer to convey the medicines to the parts in the form of spray; or to pour boiling water on them in an open vessel, and breathe the steam from them—covering the head and vessel with a blanket or shawl. A suitable infusion for such uses may be made of wild cherry bark with a little camomile or tulip-tree bark. Or a very little blue cohosh may be used with considerable cherry bark. Camomile, hoarhound, pennyroyal, and tulip-tree bark, are excellent when steam from medicines is to be inhaled; and a few tablespoonfuls of vinegar added to the vessel, hastens the loosening of the tough mucus that is so liable to choke up the passages. Whether spray or vapor is used, it must be repeated many times a day; for the course of the malady is rapid and will not admit delay in medication. Between these applications, the patient may use a lozenge made of four parts wild cherry, and one part each golden seal, black cohosh and prickly-ash bark, finely powdered and mixed with eight parts powdered elm bark and twelve parts sugar; moistened with a proper amount of water. Such lozenges may be kept in the mouth almost constantly, and allowed to dissolve slowly.

At the same time apply the Nervine Liniment to the throat every few hours; and after each application put over it a flannel wrung from pretty warm suds, and cover lightly with a dry flannel or towel. Or light fomentations to the throat may be made of smart-weed, or of powdered ginger in flaxseed as a poultice. The throat will stand a considerable amount of stimulation outwardly; and prickly-ash bark is often none too strong in a flaxseed poultice, and very bad cases may require a very little cayenne pepper for a few hours. If the patient can swallow, a warm infusion of the Sweating Powder should be given every hour.

Bathe the extremities with warm water every few hours, to aid in keeping the skin softened and drawing the blood away from the throat. Move the bowels promptly by a large injection of water containing salt and a little ginger, or by a strong infusion of boneset with some ginger. Give all foods in the form of liquids—as broths, soups, etc., well seasoned. Some have so much difficulty in swallowing, that nourishment has to be given by the bowel every three hours; as of thick barley water with beef essence.

If the severe symptoms do not yield decidedly after the second day, there is danger of suffocation from the accumulation of tenacious mucus in the throat, or from the swelling of oedema. This danger may arise in a few hours after the attack, or come on suddenly at any time. Whenever there is any sharp effort to get breath, astringents with stimulants must be used immediately and vigorously. For such purposes, a teaspoonful of tincture gum kino may be taken at once, and half that amount repeated every half hour or hour till relief has been obtained. The effect is wonderfully prompt; and shows how important it is not to use lobelia or other strong relaxants in this disease when such symptoms are present. Other strong astringents may be used instead of kino, such as infusion of cranesbill, or oak bark, or hemlock bark, or sumac bark or leaves. A few doses will generally be sufficient to check this dangerous progress, and then smaller quantities at longer intervals. At first the patient, in an agonizing struggle for breath, may declare it impossible to swallow at all; but he should be urged to gargle as well as he can with the astringent preparation, and then make a strong effort to swallow a portion. The second dose is taken more easily. But if it prove impossible to swallow, use the atomizing apparatus without delay.

After the attack has been overcome, convalescence is to be assisted with such an article as the Nervine Tonic after meals; and the Compound Spikenard Syrup and Syrup of Cherry bark, in equal parts, every hour or two, to give strength to the vocal organs. If the parts remain weak and the voice low, use some of the Bread of Life lozenge. Speaking and singing must be practiced very carefully after such an attack, lest there remain a permanent injury to the organs with a "cracked" voice; and the throat must not be too much muffled.

CHAPTER LXX.

CHRONIC CONGESTION OF LARYNX.

CONGESTION of the larynx may arise independently of any other malady, or may follow upon the acute inflammation of these parts described in the last chapter. In scrofulous and consumptive constitutions it may gradually develop grave forms of disease,—"throat consumption," with its peculiarly deep and hollow voice, being

always a very intractable difficulty. Gourmards and hard drinkers are liable to this congestion. Persons using much tobacco repeatedly develop it in a severe form; and sometimes these persons have a simple congestion pass gradually into ulcerous conditions that are liable to end in a cancer or other malignant affection. Very persistent ulceration that never becomes cancerous, may exist in some cases. It is not a common malady.

Symptoms.—The chief symptom is a marked change of the voice, which becomes thick, muffled, low, almost whispering at times, varying to a “cracked” and squeaking sound on attempts to speak loud or to sing. There are varying degrees of tickling and uneasiness in the throat; and frequent attempts to clear it by hawking, or by a short hacking cough, the expectoration being usually a few grains of transparent jelly, or some mucus and pus if the parts are ulcerated. Cold weather increases the troubles; warm weather moderates them.

Treatment.—The vocal organs must have rest, and the person talk but little and always in a low tone. A dry and temperate locality must be sought, especially if consumptive tendencies exist. Good digestion must be kept up by the daily use of some good tonic. Spraying the throat two or three times a day with infusion of poplar bark, witch-hazle, or dioscorea with a little blue cohosh, is advantageous; or cherry bark and a little golden seal may be used. Yerba santa is a good article to use in quite small quantities in a lozenge; and the Bread of Life is acceptable to many. It is well to examine the palate, as it may have fallen down and will need the treatment elsewhere directed.

CHAPTER LXXI.

ACUTE BRONCHITIS, BRONCHIAL CATARRH.

WHEN the mucous membrane of the lower air passages suffers the engorgement of blood that follows exposure, as described in Chapter LX, it becomes a bronchitis (bronchial inflammation); and the flow of mucus that results gets to it the term bronchial catarrh or “cold on the chest.” Bronchial inflammation may also result from inhaling dust, irritating gases, very hot air, etc. Some persons are peculiarly liable to this trouble, as children until after they

have shed their first teeth, old people, persons of lax tissues and following sedentary lives, and scrofulous constitutions, who are liable to a bronchitis at almost any moment from influences that other people with less susceptible mucous membranes would scarcely feel. Sundry trades are actively provocative of almost continuous bronchial irritation by the dust connected with them, as milling, stone dressing, steel grinding, and others. Some acute fevers with eruption are quite likely to have bronchial inflammation connected with them in greater or less degree, as measles, small-pox and typhoid; and many times the malarial poisoning will affect the bronchi. Yet the chief cause of bronchitis in all its degrees is exposure to chilliness, cold winds and dampness. Families who live in houses with bleak exposures, are exceedingly liable to it. Children frequently get it from being bathed in cold water in a room that is too cold.

Symptoms.—Bronchial inflammation may attack only the larger air passages; or it may reach down into the very small and hair-like passages, gravely increasing the dangers. Symptoms vary somewhat, according to its position and extent, but I will describe the common and plain course that cannot be mistaken.

It begins with the symptoms of a common cold, usually with a cold in the head, as described in foregoing chapters. There are slight feelings of chilliness, feelings of soreness and stiffness through various muscular parts, a disposition to stretch and yawn, and some lassitude. The small shiverings come and go for several hours; and in severe cases it is not uncommon for these to be felt after fever rises, the least movement in bed or of the bed covering sending a little chill across the surface for a few moments.

In a short time the patient begins to feel feverish over the surface; and after a few hours a mild fever is established, with these slight chilly feelings flitting back and forth. The fever of a bronchitis is not very high, the pulse of an adult being usually from ninety-five to a hundred beats to the minute and of good volume, while the temperature of the body ranges from 100° to 102° F. With its appearance there come on considerable headache in the forehead, pain and stiffness of the larger muscles and joints, and a greater sense of prostration than the degree of fever would otherwise suggest; some become exceedingly restless, especially children, and these are liable to extremely uneasy and tossing nights, with some night delirium.

Cough sets in early, with considerable tickling in the throat,

and a sense of rawness and soreness in the lower windpipe and across the upper part of the chest. It is a short and very frequent cough, with a heavy sound, and a change to hoarseness of the voice if the larynx is involved in the inflammation. It does not often cause pain or distress; but it presently begins to show an inclination to return in paroxysms, or "coughing spells," and then may be quite distressing, disturbing the sleep greatly, mayhap provoking nausea or even vomiting by the sudden shakings of the stomach, and causing much muscular soreness across the lower portions of the chest.

At first there is no expectoration with this cough; but in one or two days there appears sputum, which may be thin or exceedingly tenacious, transparent or opaque, milky or yellow. In some cases the amount of expectoration is small; in extended cases it becomes great and even exhaustive. For the first few days it is loosened with difficulty, but gradually becomes looser and is discharged with little effort. Its presence in the bronchi gives more or less rattling sounds in the chest, sometimes coarse and rough, at other times fine and crackling.

In a few days the symptoms begin to subside and the fever disappears; the cough remaining a week or two, with gradually diminishing soreness of the upper chest and slowly decreasing expectoration. It may be protracted for many weeks, however, in bad cases and in rough weather, especially with feeble persons and those who are exposed. Among these there is always danger that an ordinary and a simple bronchitis will be prolonged, and gradually assume a chronic form.

But all cases of bronchitis do not give this plain and not very severe history. When the inflammation extends to the smaller tubes, the danger is much increased and the symptoms are correspondingly violent. Shivering is more distinct, the sense of prostration is considerable from the start, the fever is greater than before and the breathing much more hurried. The cough is almost incessant, or in painful paroxysms; the chest muscles become very sore; the expectoration is at first scanty, frothy and exceedingly tenacious, after a few days more copious and less tenacious. In feeble and elderly persons, but even in robust people, the face may become dusky or quite pale; the pulse run up to 130 or more, and become small; the tongue get dry and dusky; and the patient become very wakeful and restless, suffering an ineffectual cough that is hacking, incessant and exhausting. So tenacious is the

sputum that the feeble coughing efforts cannot remove it; and the air then fails to reach the lungs freely, some delirium ensues or the mind becomes comatose, the surface is cool and pale, and a cold perspiration finally appears. All these are exceedingly dangerous symptoms, usually ushering in death.

In young children, this serious form of bronchitis may advance very insidiously, causing no suffering and attracting no attention from the parents, who look upon it as a trifling cold. But the bronchi of children are very small; and suddenly the breathing may become very rapid, the lower ribs draw in at each inspiration and a wheezing sound accompany it, the child be restless and then become pale and drowsy, the coughing fits crowd the face for a few moments with dusky blood, and every symptom become severe in a few brief hours. Unless such little patients are relieved very soon, they become pale and moist, and die quite unexpectedly. Many a child has a cold that is rough and distressing, yet never becomes serious; while on the other hand a little cold in a young and feeble child may hurry it to the grave almost before the parents are conscious that it is really ill. In them these fatal results may ensue in from three to five days, or even less. If immediate danger be escaped, in young or old, there is liability to profuse and easy expectoration of considerable pus with mucus from an ulcerous condition of the membranes; and this is exhausting and dangerous.

Healthy persons in middle life rarely die of bronchitis, as in them it usually is limited to the larger tubes and so does not interfere materially with the function of the lungs. But in the young, the old, and the feeble (as also in the robust occasionally) bronchitis in the small passages is common, and it is never otherwise than an exceedingly dangerous disease. It carries off great numbers of such people, being frequently considered as pneumonia. So long as the pulse remains full in size and the countenance ruddy, no danger may be apprehended though the cough should be violent and the expectoration large and the patient quite restless. But in the aged, a small pulse, and fever and restlessness alternating with drowsiness, are invariably suggestion of great danger. In children, a pale, ashy or very dusky face, occurring with a distinct inclination to quietude and heavy sleep, are equally dangerous.

Treatment.—In all cases, the patient should occupy a room well ventilated, with the temperature preserved as evenly as possible at about 72° F., and the atmosphere kept a trifle moist. A room as

cool as a sleeping room should be for the healthy, is too chilling for these people and endangers an extension of the bronchitis. An atmosphere that is too dry will dry the surface of the air passages and make the discharge of the bronchial mucus quite difficult; while air that has been overloden with moisture will relax the smaller tubes and increase the swollen condition of the lining of all the passages, hence must be avoided as judiciously as one that is too dry. A person with even a moderate bronchitis should be housed carefully for ten or twelve days, lest a chronic inflammation be settled upon him ; and the severe cases require the best care and prolonged housing, for if there be any neglect there will certainly be future trouble. One of these troubles may be what is called "hasty consumption," which may be provoked readily in slender persons, whose tissues are lax, and who have a tendency to ulceration on the surface of the air passages after even an ordinary bronchitis. But unwise exposures and exhaustions of hearty people may suddenly cause death from this "hasty consumption."

In moderate cases, pursue the course that has been directed in Chap. LX for breaking up a cold. It is generally a simple matter to obtain a perspiration, and it should be maintained gently while a quickened pulse and other signs of fever continue ; but is not to be urged to profusion at any time, nor continued when the fever subsides. Unless the diaphoretic drinks and warm foot baths are discontinued then, they will weaken the patient and leave him liable to a fresh cold from the simple draughts in his own room. For the chest soreness and tickling cough, some demulcent drink must be given—a tablespoonful or more every hour or half hour, as needed. One of the best of these is an infusion of flaxseed, with enough ginger in it to make it slightly spicy, and a mere trifle of nutmeg. It is usually best to sweeten it a little, and always to keep it warm, making it fresh every few hours. By adding a little lemon or good vinegar to this, enough to make it pleasantly tart, a really fine soothing and expectorant preparation will be made, and one which may be given as freely as desired during the first days of the fever stage. Other demulcents may be used for the same purpose, among which are the common garden mallows, the marsh-mallows root of the drug store, and the bark of slippery elm. Demulcent preparations should never be made too strong, as then they soon become offensive to the stomach.

A small quantity of licorice added to any of these infusions is excellent to allay the tickling and the soreness; but one is usually

tempted to use from five to ten times as much of this article as is really advisable. While the phlegm remains very tenacious and the cough hard, a small portion of lobelia would better be added to the diaphoretic infusion, and continued when the discharges begin to get free. Sometimes, when the amount of mucus becomes very great and causes coarse rattling sounds in the chest, lobelia may be pushed in pretty full quantities with the infusion until vomiting is secured, which will give immediate relief to the chest and the breathing.

To aid in the treatment, the diet should be light and plain, and consist largely of warm gruels, farinas, soups, broths, and similar fluid aliments. Let the bowels be moved early and rather freely, and then keep them gently open without purging. If the chest is sore, it will be advisable to use the Nervine Liniment over it two or three times a day. Children do well to have the chest rubbed all over and around with goose grease, lard, cold-cream ointment, or some other fatty material, and then covered with an extra layer of flannel. I am very partial to cutting a piece of good manilla or writing paper to fit about the neck and under the arms, covering one side with a layer of mutton or beef tallow, (cold-cream ointment is better still), and sprinkling upon this a good grating of nutmeg and an equal or larger amount of powdered ginger. By laying this upon the chest of the child, its clothing is kept cleanly; and the influence of this simple application in relieving the bronchi and loosening the phlegm, is very decided. It may be removed every twelve or six hours. Or one may use warm poultices of flaxseed sprinkled with ginger. Onion fomentation is an old but a stinking family prescription; and all poultices are clumsy appliances here.

When the fever goes by, a soothing cough syrup is to be used. A suitable one may be made of one ounce glycerine, two ounces of infusion of ginger of moderate strength and containing a very little licorice, four tablespoonfuls granulated sugar, and a few drops essence of anise. This may be given somewhat freely as often as the degree of cough may require,—sometimes once in two hours or hour; again in smaller doses every five or ten minutes, if the tickling and tendency to a coughing fit are urgent. It will generally be well to continue a pretty steady use of the above flaxseed infusion until the soreness is quite relieved and the expectoration becomes pretty free. When the cough is thoroughly loosened, a rather strong infusion of wild cherry bark, with all the sugar it will dissolve when cold, and a tablespoonful of glycerine to each ounce,

with a very few drops essence of sassafras or anise, will be found a good cough preparation. I am fond of using here the Syrup of Cherry and Spikenard given among the formulas, which is an admirable preparation for all this class of cases, and one that can be depended on. Compound Syrup of Comfrey is another reliable article. Such syrups should be continued for many days, or until the cough is entirely relieved; for it is very poor policy to half cure such a cough and then leave it to get well of itself. In addition, a little licorice or gum arabic may be held in the mouth to dissolve slowly, and will be of value in relieving the tickling in the throat.

When the smaller tubes of the bronchi are the seat of the inflammation, and the patient begins to evidence the weakness, pallor and other symptoms above described, it will be necessary to adopt a more sustaining plan in treatment. Demulcents will not do, lobelia is totally out of place, and an emetic is simply inadmissible. About the best infusion to use now will be one made of two parts each white root and ginger, and half a part each of blue cohosh and dioscorea. Two to four or more tablespoonfuls of this may be given every half hour; and it will sustain the outer circulation and the nerves, at the same time relieving the bronchial tubes. If the pulse become quite small and very frequent, the heart must be sustained by powders of about five grains hydrastis, (or one-half grain hydrastia sulphate), and half a grain or more of cayenne pepper, given every three or two hours. Or a very little cayenne may be added to the infusion, and then the hydrastia and two grains of dioscorein be given in powder.

At the same time it is necessary to use quite strong stimulation outwardly over the entire chest. A strong wash of four parts lobelia herb and one part cayenne, or three parts tincture lobelia and one part tincture cayenne, or a fomentation of smart weed, Stimulating Liniment for the severest cases, are all suitable. Such applications may be repeated every three or four hours, according to the redness of the skin they cause; and their action must be hastened by a thin and pretty hot poultice of flaxseed, covered with a piece of oiled silk to keep in the moisture and warmth. While this course is exceedingly vigorous, it is quite necessary in cases of this kind. Young children, who pass so quickly into a heavy sleep, should be pretty thoroughly wakened up at intervals; for this encourages coughing, which is very necessary to dislodge the phlegm. A child left to itself, would simply sleep itself into death. Or it may occasionally be incited to cry by a dash of cold water.

After these severer attacks, convalescence must be guided with great care. Feebleness and a greatly protracted cough may be expected in all but very robust people; and grave conditions will surely follow, unless the patient is well and steadily built up. A suitable tonic cough syrup may be made of four ounces spikenard, two ounces of wild cherry, and half an ounce each boneset and dioscorea. If the cough is very loose, better use yellow poplar one ounce instead of the boneset; and after each meal give a moderate dose of Peruvian bark as a tonic. If the cough should be rather tight, the Compound Syrup of Spikenard is suitable, and the Nervine Tonic after meals. In malarial districts, the tonic should always be of an anti-periodic class.

CHAPTER LXXII.

CHRONIC BRONCHITIS. WINTER COUGH.

RENEWED attacks of acute bronchitis are quite likely to develop the chronic form of this inflammation; which may then return every fall and continue through most or all of the winter, with a remission in summer. It may be of a mild type, and cause but little suffering; but is inclined gradually to become more and more severe. Feeble and elderly persons are most liable to it, and with these it may continue many years, gradually carrying them downward. It is often spoken of as "old man's cough" and "winter cough"; but it finally persists through summer and winter.

Symptoms.—These are similar to the symptoms of a catarrh, more or less modified. Cough is present, returning in paroxysms of varying frequency and severity, often provoked on lying down, usually worst in the morning from the accumulations that take place during the night. Sometimes the cough keeps the patient awake for an hour or two after he retires; and wakens him very early in the morning. Expectoration varies from a thin to a tenacious mucus, or to a considerable quantity of mucus and pus together. There is always soreness through the chest, especially the upper portions, and the trachea. Swelling of the membranes narrows the bronchial tubes, and thus causes distress in breathing, together with more or less wheezing. Coughing fits often cause much distress through the chest, soreness and sickness at the

stomach ; and fill the veins of the face and neck, causing headache, weeping at the eyes and considerable discharges from the nostrils. Slight exposures to draughts, dampness, dust, and other sources of irritation will quickly excite an attack.

It is an exceedingly persistent and annoying malady, rendering life very uncomfortable ; but it is not often dangerous except as it may be followed suddenly by a capillary bronchitis that may prove rapidly fatal. It always keep the person reduced in strength, and sometimes quite feeble ; and in the aged and debilitated is usually quite incurable but may be made more endurable. Some cases spring from heart troubles.

Treatment.—This must always aim at sustaining the patient by every suitable measure of hygiene, diet and medication. A mild climate is desirable where one's purse is able ; hence the removal to Florida or other suitable part of the South in the winter, and to a Northern position in the summer. When these migrations are not obtainable, it is desirable to secure as even a temperature as possible in a Northern home during the winter, and carefully avoid all sharp exposures.

The existence of cough and soreness usually tempts to the use of some "loosening" cough syrup ; but such relaxants and expectorants as lobelia, Greek valerian, black cohosh and others like them, must be employed with great moderation, and only in conjunction with toning and stimulating agents. In elderly persons this is most emphatically demanded. It is always best to sustain the whole system, as well as the lungs and heart ; and medicines are generally best given from four to six times a day. A suitable syrup preparation for many cases may be made of two parts each comfrey and Solomon's seal, and one part each spikenard and boneset, and is demulcent and soothing. If the expectoration is abundant and loose, the boneset would better be replaced by poplar bark. I have often had good results from using the Compound Syrup of Mitchella, adding two drachms fluid extract of spikenard to each eight ounces of the syrup. Expectoration may be so great and pus-like as to be exhaustive, and then a suitable syrup can be made of four parts cherry bark, and one part each cramp bark, poplar and spikenard. The Compound Syrup of Spikenard is a fine preparation when a steady expectorating influence is needed with a tonic. A similar but less expectorant syrup may be made of four parts each spikenard and cherry bark, and one part each blue cohosh and tulip poplar, and one-fourth part of elecampane. If, while using

this, the expectoration should become difficult, a very little lobelia may be used in connection with it till the phlegm again becomes loosened. Some of these patients do exceedingly well on balsamic articles, to which class the spikenard and tulip poplar really belong. Other balsams are those of tolu and Peru; and a teaspoonful of a syrup of either of these added to half a pint of any of the above syrups, is many times an advantage unless the air-passages are very irritable, and then these balsams should not be used. Tar water is a favorite with some, when the irritation is little or none. When the irritation is decided and soreness considerable, the leaves of mullein may be used freely in any of the preceding syrups; and the bruised leaves or flowers, or a strongly concentrated preparation from the leaves, applied outwardly.

It is usually a good plan, in addition to one or the other of the syrups, to use a lozenge or troche in limited quantities during the day. A suitable lozenge may be made of the powders of one ounce each golden seal, cherry bark and dioscorea; one-fourth of an ounce each prickly-ash bark and tulip poplar; two ounces licorice root powdered; four ounces powdered gum arabic; one pound powdered sugar into which have been well rubbed twenty drops oil of cubeb and forty drops oil of peppermint.

In all cases of this kind it is important to use outward stimulation across the upper part of the chest. One of the most suitable of these is the Nervine Liniment; and when desirable, it may be made yet more stimulating by adding a small portion of tincture capsicum. Such a liniment should be used twice a day; and the chest is always to be protected from the effects of sudden changes by a suitable under-jacket, using a very light weight in summer. These troubles are frequently started or made worse by wearing heavy fur or other mufflers about the throat, especially beginning their use early in the fall. In this way the throat is softened and the skin brought easily into perspiration, when cold will be taken very readily and bronchitis provoked. Protection of the throat should always be moderate. When a person's occupation is among dusts, a protector should be worn over the mouth and nostrils to arrest the ingress of the fine particles; and such persons should always breathe through the nostrils when possible. If the irritation become considerable, the occupation should by all means be abandoned.

Some narrow-chested people of light complexion and slender frame easily have a slight grade of bronchitis involve the lung tissue. They may have but a trifling cough, a small amount of ex-

pectoration, and but little soreness of the upper chest. But they have a poor appetite, become short-breathed on limited exertion, and their sense of weakness is quite out of proportion to the small cough and suffering. In this fact lies a grave danger with these people; who attribute their diminished strength solely to a poor appetite, and persist in giving no attention to the chest until the most serious forms of disease have insidiously laid hold of them. People of this class require mild tonics and balsams, such as a syrup made of four parts each spikenard and comfrey, one part each blue cohosh, bugle weed and boneset; which may be used four or more times a day, together with the outward stimulation. Golden seal or the Nervine Tonic may be used after meals; and immediately before the meals some maltine or other preparation of malt. It is with these persons that a little cod-liver oil, especially when combined with maltine, shows its best effects; though I am decidedly in favor of using cream, butter, and other palatable fats instead of this disagreeable oil, as in consumption. A life that is largely out-of-doors, and a home on suitably elevated ground, are of the first importance.

CHAPTER LXXIII.

PNEUMONIA. LUNG FEVER.

PNEUMONIA is also called Inflammation of the Lungs, and Congestion of the Lungs. It is one of the most dangerous of all acute diseases, coming always from exposures and belonging to the cold months. It consists essentially of a sudden forced recession of blood from the surface by the action of cold (p. 400), and the accumulation of that blood upon the lungs. Here some portions of the blood are driven through the thin walls of the vessels by the sudden and great pressure, and fill the air-vesicles. A part of one lung may be thus occupied, or a part of each lung. All air is, of course, excluded from the parts into which the blood thus exudes; and the blood in the small vessels around these parts circulates very sluggishly. If the circulation can be restored to the surface promptly, and the weakened vessels in the lungs again strengthened up for their work, and the heart well sustained, then the blood that was forced out of the vessels and into the air-cells will gradually be

taken back and health be recovered. But if these results fail to be accomplished in a few days, then the patient will die from exhaustion of the heart and the partial exclusion of air from the lungs. Or later on the exuded blood will decay, and he will die from gangrene. He may escape these two dangers, and afterwards have serious or fatal abscesses of the lungs.

Pneumonia is an extremely alarming malady, under all circumstances and in all degrees of it. The danger increases with the extent of lung occupied ; and is also enhanced by youth, by advancing life, and by feebleness of the general constitution. The most vigorous and robust people are quite liable to it, under sudden exposures, for it is literally no respector of persons. It is liable to leave the lungs weak and sensitive for years afterwards ; and those of small lung power may trace a serious or fatal lung disease to an attack of pneumonia.

Symptoms.—Although the direct attack of pneumonia is always quite sudden, it is very seldom indeed that there is not a series of symptoms and feelings which give warning of the approaching danger. These admonitions are very much the same as in any common cold ; and if they are heeded and properly met (Chap. LX), the impending danger of pneumonia may generally be averted. It is because these admonitory signs are disregarded and passed by as more trifles, that so many cases of this dangerous malady are developed, and that so many are rushed off to the grave by it.

The premonitory symptoms alluded to generally begin a day, or two days, before the actual attack. The person has a general feeling of chilliness over the entire body, making him cold and uncomfortable. At the same time he is somewhat feverish, yet finds himself unable to get quite warm although he comes frequently to the fire, or buttons his clothing more closely up as he goes out to business. The least draught of cool air increases this chilliness ; he feels cooler and more uncomfortable as night approaches ; and in the night is likely to ache somewhat through the limbs, have hurried breathing and a quickened pulse, and probably to be troubled with a little cough. His sleep is disturbed, although a warm sleeping-room may cause some of these bad feelings to moderate. In the morning he feels better, probably considers his cold gone, and goes to his business. But if pneumonia is in its forming stage, the bad feelings of the previous day will return toward evening ; and the malady is pretty sure to develop that night or the next day, if prompt steps to break up the cold are not taken.

The direct onset of the attack is by a sudden and quite severe chill, which may last from half an hour to several hours without remission. Vomiting may occur during or after the chill, and children sometimes start in with convulsions. Pain and difficulty of breathing follow this chill very quickly. The pain is near the nipple, sharp or stabbing in its character, and much increased by sneezing, coughing, deep breathing, or other movements of the chest. Sometimes there may be no suffering, especially in aged and feeble people and when the inflammation is in the upper part of the lung; but in all cases the breathing becomes short and hurried, the rate advancing in a little time to twenty-five, thirty or more respirations a minute. It is noticed that the breathing is rather superficial, the air not reaching deeply into the lungs; and the wings of the nose rise and fall more or less violently with each respiration.

Fever begins at the same time, the skin being very hot, the face strongly flushed, the pulse of good size and running to about 100 to the minute, and the back and limbs feeling sore. The voice is low, talking being quite an effort and interrupted by the hurried breathing. A harsh and dry cough sets in early, causing much distress through the chest and inducing strong efforts to suppress it. The patient is very restless, moving almost continuously, and possibly a little delirious at times.

These symptoms go on with increasing distinctness till the third or fourth day. By this time the blood has exuded from the vessels and occupied the air-cells of that portion of the lungs which is inflamed, and this causes the breathing to be yet more hurried and much more laborious. Each act of respiration causes a drawing and heaving effort of the muscles of the chest, but without corresponding motion of the ribs. The cough loosens small quantities of glairy, white, and exceedingly tenacious mucus, which sticks so closely to the mouth and lips that the patient may have to wipe it away. By the fourth day this expectoration is a little more abundant, and is also streaked with a little blood; and during the next few days becomes more or less decidedly reddened by the presence of blood, or possibly a thin and red-brown fluid resembling prune juice. This latter appearance is very rare, but may occur in the aged and in extremely dangerous cases. Meantime the pulse mounts up to 120 or 130 per minute and gets smaller, the heat of the body increases, the face looks dusky, the eyes are more or less pushed forward in the struggle to get breath, most patients lie on the back,

the tongue is coated and dry, there is persistent restlessness and no proper sleep. Striking gently over that portion of the lung where the air-cells are filled with blood, will elicit a dull sound almost as flat as striking a board.

About the seventh or eighth day of the attack there is a decided abatement of all these symptoms, if the patient is likely to recover. Difficulty and hurry in breathing lessen distinctly, the fever subsides very much, the cough becomes looser and nearly painless, and the patient gets quiet and falls into a gentle sleep during which a little perspiration is likely to appear about the face and neck. He awakens much relieved, the general symptoms disappear rapidly, and soon he is convalescing.

But if the case does not progress favorably, the fever does not abate about the seventh day, but the pulse gets higher than before, the patient is more restless or again becomes delirious, some get stupid, and the respirations mount up to forty or more per minute. After a week of such severe symptoms, the patient may suddenly get relieved and begin to improve; but this is not at all probable except in the most robust people. A drenching perspiration may set in with some, but is far from being a good sign unless the other symptoms are decidedly improved at the same time. Dusky face and hands, enlarged and dark veins, and stupor or delirium, are very unpromising signs after the sixth day.

Among the intemperate, aged and enfeebled, there may be no pain or cough for the first three or four days; but the hurried respiration and catching for breath between every few words attract attention. Bronchitis is quite prominent in some cases, and inflammation in the smaller bronchial tubes makes the pneumonia much more dangerous. Pleurisy is sometimes present and increases the suffering; some patients get sallow, or even jaundiced.

Typhoid pneumonia is a form of the disease met among aged and feeble people, and in malarial districts. In this form the advance is sometimes gradual, and may be mistaken for typhoid fever. Great and general prostration appears early; the tongue is very dry, and soon is covered with brown crusts; and it is common to have the bowels tender, with fluid passages, as in typhoid fever. Such symptoms, added to the usual fever, hurried breathing and cough, mark a commonly fatal form of pneumonia. Persons addicted to drink may have the attack ushered in with symptoms resembling delirium tremens, with little cough or pain.

If the case does not begin to get better pretty rapidly about the

seventh day, the contents of the air-cells are liable to suppurate; and then there will be a large amount of yellow material spat up, which causes a persistent cough and much exhaustion continued for several weeks. In some instances, abscesses will form in the lungs, many days or weeks after the first symptoms have yielded. Abscess may be suspected when the fever abates at the proper time but does not pass off,—a small and hurried pulse continuing, with some heat on the surface, and then slight shiverings. Abscesses may burst suddenly, causing a large amount of discharge sometimes; and unless a patient is promptly turned nearly on the face at such a time, he may be strangled by the pus. An abscess causes a cavity that heals up very slowly, leaving the patient feeble for a long time.

Gangrene of the lung, or a small part of it, is a rare result; but may occur after the twelfth day in feeble and impoverished persons. It causes a peculiar and sudden loss of strength, small and irregular pulse, pinched and distressed expression of countenance, perhaps very cold face and extremities, and an extremely foetid breath. It is scarcely possible for one to recover from such a condition, yet recovery may take place if the extent of the gangrene should be very limited.

Most persons who die of pneumonia do so between the fifth and seventh days from the attack. The alarming signs are, thin and brown expectoration of almost all blood; increasing duskiness of the face and blueness of the hands; at last a sudden yellow tinge of the face; breathing forty or more per minute; increased heat of the trunk, with cold hands and feet, and cold face covered with perspiration; pulse above 140 per minute; low muttering delirium, with almost constant moving of the hands.

Treatment.—So rapid is the course of pneumonia, that what is done for its arrest must be done quickly and with the greatest energy possible. A few hours delay, or trifling with inefficient measures, may be fatal; but vigor that succeeds in limiting or wholly preventing the flow of blood into the air-cells, will make the case light and easily managed to its recovery. One great reason for the terrible fatality of pneumonia in the past, was the practice of blood-letting. A cause of its enormous fatality in our own times, is the use of aconite and veratrum (hellebore). Both these methods of treatment aim to reduce the fever by lowering the action of the heart. No doubt they do this effectually, much too effectually for the good of the patient. Such measures and such articles reduce and paralyze the *strength of the heart*, take away its tone and

power. The one great overwhelming danger in pneumonia lies in the loss of power in the heart to keep up the outward flow of the blood. If this can be done, the lungs can be saved ; but if the heart lose in its strength, the lungs and everything else will succumb to the disease. A patient with pneumonia is a hundred times more likely to recover under the nursing and despised "herb teas" of some sensible old lady, than when the most "scientific" doctor in the world draws from his arm an ounce of blood or gives him any portion of the fearful heart-paralyzers—aconite or veratrum. The profession at one time thought no case of pneumonia could possibly be cured without bleeding, and he who would not use the lancet for it was called an ignoramus and a quack. But the world and the profession have learned that the drawing of blood greatly increases the mortality of this disease, and makes recovery almost impossible ; so bleeding for it has been abandoned. Aconite and veratrum and all other paralyzing agents are equally damaging, though much used and lauded at this day ; but the frightful mortality and the suddenness of dying they cause, will presently abolish them from civilized communities.

Keep the room of the patient equably warm, day and night. It will not do for the temperature to be allowed to run down, but it must be steadily maintained at about 70° F.; and at the same time be well ventilated and kept very slightly moist. Bathe the entire chest every three hours with four parts Nervine Liniment and one part tincture of cayenne ; and then lay on it a towel or flannel wrung from rather warm water, and over this put a dry towel or a layer of oiled silk. Or a thin and hot flaxseed poultice may be used on the chest, and covered with a dry towel or oiled silk. Outward appliances of either kind must be renewed as often as they get cool ; and if the liniment smart the surface somewhat sharply, so much the better. If the feet are cool, they must be bathed every six or eight hours with quite hot water, and kep' warm with hot bricks wrapped in damp cloths. Move the bowel gently with senna, rhubarb syrup, or any mild physic ; but on no account induce free catharsis.

Inwardly give a moderately strong infusion of two parts white root, and one part each ginger and dioscorea,—two to four table-spoonsful every hour or oftener. The Sweating Powder is also proper ; it being necessary to get the blood to the surface and start a mild perspiration, but never to drive a profuse perspiration. For the thirst, use a weak and warm tea of flaxseed, spearmint, balm,

or catnip as desired; but avoid cold drinks, except in the most sparing quantities. Although these are mild measures, their persistent and vigorous use is much better at this stage than are stronger means.

By the third day of the attack, or the fourth at latest, more stimulating articles are necessary to prevent prostration. Use more tincture of cayenne in the liniment; and moisten a flaxseed poultice with a weak infusion of cayenne. It is very important to have the surface over the chest pretty well stimulated, yet reduce the amount of cayenne if the smarting become too great. To the infusion above named add one part blue cohosh, and give steadily; and besides give three grains golden seal and one grain scullcap, in powder, every three hours. If preferred, the golden seal and scullcap may be made into infusion, and given every three hours.

If the surface look blue and the pulse become small, the respirations mounting to thirty-five or forty to the minute, the infusion should be made of equal parts ginger, dioscorea and blue cohosh, one-fourth part prickly-ash bark, and a goodly sprinkle of cayenne. Never mind the word "fever," nor become alarmed at the idea of stimulants in it; for the heart must be sustained by sanative stimulation at such a time as this, but never by alcoholics. Give the golden seal and scullcap as before, increasing the dose; or give instead a powder, every three hours, of two grains scutellarin, one grain hydrastis sulphate and half a grain to a grain of cayenne. Such powders may be given in a capsule. Enormous amounts of stimulants may be needed over the chest, before any decided impression will be made by them. In addition, it may be necessary to give an injection, every three hours, of four parts blue cohosh and one part each golden seal and scullcap, in thin starch water.

These are the measures to be relied on. It is not advisable to use lobelia or other expectorants, for they relax the tissues too much. Yet if the head is very hot and the mind wandering in the first four days, an enema may be given, every four hours, of an even teaspoonful each lobelia and lady slipper; but not after the fourth day, when the conditions change. If the case show typhoid symptoms, there must still be the same persistent use of the stimulation already named.

When change for the better takes place, the cough of convalescence may be treated with the Syrup of Cherry and Spikenard; yet if the patient seem feeble and relaxed and the cough is very loose, the Compound Syrup of Hoarhound will be more suitable. Nervine

Liniment may be continued three times a day ; and the Nervine Tonic given after meals, or the Spiced Bitters used if there are profuse expectoration and decided loss of strength.

The diet should be easy of digestion, but quite nourishing. Beef and other broths, milk, soft or raw eggs, and similar articles well seasoned, should be the principal foods. Aged and debilitated persons require food every three hours ; and if the stomach is too feeble to digest a sufficient amount of food, it should be given by enema.

CHAPTER LXXIV.

PLEURISY.

THE pleuræ, thin membranous sacs investing the lungs, are often inflamed from the effects of cold ; and sometimes this inflammation occurs in company with pneumonia, bronchitis, consumption, and other affections of the chest.

Symptoms.—Like other acute inflammations, it begins with more or less chilliness followed by fever, pulse from 90 to 100, and a sharp stabbing or “catching” pain in the side,—a little below and to one side of the nipple in most cases, but sometimes along the false ribs or under the collar bone. This pain is extremely keen ; and is greatly increased by sneezing, coughing, a deep breath, or pressure between the ribs. One side is usually affected, but both sides may be involved. In severe cases the fever becomes more decided ; there are headache, coated tongue, pains in the back and loins, and decided feelings of prostration. Breathing is always shallow and hurried, because of the pain that deep inspiration causes. There is a short and painful cough, with a little glairy sputum ; and this causes so much pain that the patient struggles to suppress it. The patient lies on the well side ; or upon his back, when both sides are affected.

Mild cases get relief by the second or third day, having a little sensitiveness lingering a few days longer. More severe cases suffer four or five days, and then get relief. A portion of the suffering is due to the extreme tenderness of the inflamed pleuræ as their inner surfaces rub against each other in the movements of breathing ; and a portion of the relief comes from the inflammation throw-

ing out a little glutinous material upon these surfaces, by which they are lubricated and friction upon each other prevented. If then the inflammation subside, recovery is rapid.

But in some cases, and this oftenest in feeble or elderly persons, it happens that the amount of material that accumulates within the pleuræ becomes large, distending this sac with fluid and pressing upon the lung seriously and crowding it upward in the chest. A limited quantity causes no inconvenience, and is soon removed by being absorbed. But when the amount becomes considerable, reaching possibly to several pints, it is both distressing and dangerous,—being then called *Dropsy of the Chest*. It greatly interferes with breathing ; obstructs the action of the heart by pressure, and causes weak or tumultuous beating ; bulges the spaces between the ribs on the affected side, and causes the patient to turn upon that side ; and by its interference with the centre of circulation brings on thick or even bloody urine, dropsical swellings in the lower extremities, and more or less pallor or blueness of the surface. It is always a dangerous condition ; but frequently the fluid begins to be absorbed in a few days, and then disappears rapidly. Sometimes, however, it causes death in a couple of weeks ; or may accumulate slowly and remain a long time, causing various and serious diseases in the lung.

Persons who have once suffered pleurisy, are ever after liable to it on exposure. Sometimes it causes the inner surfaces of the sac to adhere or "grow together" to some extent ; or the lungs and pleuræ, or surface of the ribs and pleuræ, to adhere. Such adhesions, where once formed, continue indefinitely, keeping up a sense of restriction and more or less sensitiveness or pain in full breathing. Such complications and results are most likely to occur in those of consumptive tendencies or a rheumatic constitution ; and rheumatic conditions always increase the liability to pleurisy, and still further intensify the sharpness of its pains.

Treatment.—Keep the patient very still, and insist on the utmost quietude in bed in such position as is found most comfortable. Have the room well warmed, and the patient lightly covered. Promote a perspiration as soon as possible. For this purpose no single article is equal to the white root, the peculiar value of which in this malady has won for it the popular name of pleurisy root. It is best given in warm infusion,—four parts white root, one of ginger, and a very little lobelia, making a fine combination. Such an infusion should be given warm, two tablespoonfuls every half hour or oftener

according to the amount of fever. Or lobelia may be left out of this infusion, and used with black cohosh,—a half teaspoonful of each in tincture every hour, and the infusion between. By this plan the lobelia may be given at longer intervals, or discontinued altogether, when it has been used long enough to cause pretty distinct nausea. Use the Nervine Liniment over the side every two hours, and follow with a heated flannel, or a hot flaxseed poultice, covering with a dry towel or a piece of oiled silk. Move the liver and bowels sufficiently every day with leptandrin, or the compound leptandrin pills. If the kidneys are not sufficiently free, or the urine is dark or muddy, put some spearmint in the infusion; or every three hours give two or three tablespoonfuls of a strong infusion of queen-of-meadow root or of juniper berries. If the patient is unusually restless, give every three hours, or at the same time as the kidney medicine is used, three grains of cypripedin and one grain dioscorein; or else put the powdered root of lady slipper in the infusion with queen-of-meadow.

In the great majority of cases this course will terminate the inflammation happily, and a mild tonic then complete the cure. The diet should be plain and light; and it is always advisable for these patients to be housed prudently for many days after an attack.

A considerable measure of relief from the sharp suffering is sometimes obtained by having the patient expire from the lungs all the air possible, and then wrapping a bandage of muslin about four inches wide firmly around the chest from the lower ribs to the arm pits. This steadies the ribs and prevents motion in breathing, and may be continued for a few days.

When there is a large effusion of fluid in the sac of the pleuræ, a pretty free perspiration should be kept up by using the composition infusion somewhat liberally every second hour or oftener. Give every three hours a powder of two grains dioscorein, one grain cayenne, and half a grain hydrastia sulphate; or make a strong infusion of dioscorea and golden seal with a very little cayenne, and give a suitable dose of this every three or two hours. The pulse and the strength fail more or less in large effusions, and it is always necessary to sustain them by using tonics and stimulants pretty freely. If this dropsy become permanent, a gentle vapor bath should be used every day or second day, with plenty of composition tea before and during the bath and a goodly dose of tonic after it.

CHAPTER LXXV.

SPITTING OF BLOOD.

BLOOD discharged from the mouth always causes much alarm ; for it immediately begets apprehension that it comes from the lungs and heralds the first stages of consumption. While such losses of blood should at once elicit the most vigorous measures for their arrest, a small amount of waste being sometimes extremely weakening ; it is not the fact that all such discharges by the mouth come from the lungs, nor does it always imply the beginning of consumption when the flow is from the lungs. I will here consider the several sources of spitting of blood, and the appropriate management of each.

I. *Bleeding from the Mouth.*—The gums may become soft and spongy, and blood ooze from them on trifling occasions. Sometimes it oozes from the cheeks, the tongue, or the throat. Its amount is always small, generally it is mingled with saliva and mucus, and its color is usually bright. Examination of the mouth soon reveals its origin. No alarm need be felt, except in those few rare cases where the drawing of a tooth breaks an unusually large vessel, and the person has that peculiar state of the constitution or of the blood which disables it from coagulating and a very persistent hemorrhage follows. Curious to say, some hysterical persons and those who wish to gain sympathy by feigning disease, sometimes lacerate the gums or cheeks to make it appear that they are bleeding from the lungs. A little care in examining the mouth will quickly detect the cheat.

Such hemorrhages are, for the most part, easily arrested by a good astringent, such as kino, tannin, oak bark, or cranesbill. Any of these or other astringent articles may be used as freely as is required, either as a powder, or a strong infusion, or a tincture. Myrrh tincture is particularly suitable to spongy gums, and may be used daily to harden them after the bleeding has ceased. Such a condition of the gums may proceed from a state of the stomach resembling scurvy, digestion being poor and too much meat being used in the diet. In such cases, the stomach and diet must be regulated. Some of the iron preparations, as stated in the Formulary, are reliable for these bleedings.

II. *Bleeding from the Large Bronchi.*—Many inconsiderable losses of blood come from the larger bronchial tubes. Such cases

occur oftenest in young people, who have grown tall rapidly without a corresponding breadth and firmness in their development, and who are spare, pale, narrow-chested, delicate skinned, with a very clear complexion and disposed to bleed at the nose or elsewhere easily. Various impediments to free circulation in the chest may develop or aggravate these hemorrhages, as tight lacing, sitting in a stooping posture (as tailors), spinal curvature, tumors in the chest, etc. In rickets, scurvy, and similar degenerate conditions of the constitution, an occasional bronchial hemorrhage is one of the symptoms. The amount of blood lost is not large, and is generally mingled with mucous expectoration. It is relieved generally by removing the provoking cause, and by suitable invigoration of the general health.

III. *Vicarious Bleeding.*—By this is meant a discharge from the bronchial surfaces of blood which should have been discharged elsewhere. It is dependent on a partial or total suppression of the menses of women, the flow finding regular monthly exit by way of the lungs and bronchi. Such cases are termed *vicarious menstruation*; they occur periodically as the menses themselves, the discharge may be free and abundant, the blood is usually bright in color, and such recurrences may continue for years without involving the lungs in disease or endangering the general health. Usually it occurs toward the close of the menstruating years, and then continues until the "change of life,"—the regularity of its monthly return and the diminished flow from the womb designating its origin. Sometimes, however, it begins in earlier life. Pinel mentions a case where a young woman of sixteen menstruated properly, but had her first flow suddenly checked by fright. At the next proper menstruating period she was attacked by a violent flow of blood from the lungs, preceded by vague pains in the loins and womb, and by the other symptoms usual to menstruation, but had no discharge whatever from the genital organs. The hemorrhage from the lungs lasted two days, nearly a quart of blood being thus discharged; and this woman continued thus to menstruate regularly by way of the lungs from her sixteenth to her fifty-eighth year, and never had any natural catamenia from the womb after the first time.

I have met quite a number of these cases in middle life, which continued with regularity for ten or twenty years, the proper monthly flow being quite small. Such persons are usually rather feeble; and although apparently threatened with consumption, are

perhaps in no real danger of it. If the menses can be restored partially or wholly to their natural channel, the bleeding from the lungs diminishes proportionally. The proper course of treatment for such cases is given in my WOMAN'S BOOK OF HEALTH.

IV. *Bleeding from the Small Bronchi.*—These constitute the most alarming class of cases, the loss of blood being considerable and the prostration from it decided. First attacks are usually sudden and without any warning whatever. Subsequent attacks, which may occur at any time, almost invariably give one or more days of warning, the patient having a feeling of heat and weight in the chest, and probably some cough, shortness of breath, palpitation of the heart, cold feet and hands, and often a dull pain between the shoulders. Those slim-chested people alluded to in Class II, who are subject to bleeding at the nose, are also subject to this form of bronchial hemorrhage; and they usually suffer occasional palpitations, increased paleness, and disturbed breathing for some weeks before an attack.

Upon the occurrence of this hemorrhage, the person feels as if a warm liquid were welling up under the breast bone. Soon a strange and sweetish taste is perceived in the mouth; and upon attempting to clear the throat, he finds that he is raising blood. Such a discovery is a shock to the system, and depresses those of the highest courage; and even if the amount be trifling, it occasions much alarm and the person may grow faint and trembling. A feeling of tickling in the throat soon starts a cough; which is short and loose, and causes frothy and bright-red blood to gush forth more freely. These coughing fits return at short intervals. The amount of blood lost during an attack may vary from a few ounces to a pint or more; and the attack itself may last half an hour or several hours, after which mucus mingled with blood is expectorated for several days.

Such attacks may recur every day for several days, and then cease for weeks or months, returning at varying intervals for many years. They always leave the patient pale and exhausted, and he suffers a continuous sense of dread that they will be renewed. Most persons recover promptly from the loss of blood and the depression; but feeble subjects may become anaemic, and remain prostrated or fail somewhat rapidly. Some blood is likely to remain in the bronchial tubes in the immediate region of the broken vessels; and it then causes a sense of heat and tightness at the part, which the patient generally locates with much precision.

Sometimes it causes considerable inflammation in and around the parts, with soreness, lancinating pains, some feverishness, and general disturbance of the system. In many cases, even these unpleasant symptoms disappear in a few days; but sometimes they persist, increase in severity with each attack, and at last lead to serious or fatal disease of the lungs. It is the possibility of such a termination, even in persons who are not especially pale and slender, that makes these free and recurring hemorrhages alarming at all times.

The sensations of the patient usually are distinct as to the blood coming from the lungs, and generally he can locate the exact site of the bleeding. The blood itself is usually bright-red, more or less frothy and in spongy clots, and is accompanied with a cough. By such facts it may be known that the bleeding is from the lungs and not from the stomach, the latter class of hemorrhage presenting features that will be mentioned presently; yet large bleedings from the lungs may obstruct the tubes and prevent the access of air, and then the blood cast out will be dark in color and not frothy. An extremely rapid flow of bright blood not made frothy by admixture with air, probably comes from the sudden rupture of a vessel of considerable size, and is likely to terminate fatally in a short time if not effectually checked.

During such an attack, place the patient on his back in a half-sitting posture, loosen or remove all tight-fitting articles of clothing, throw a light cover over him, allow plenty of air to the room, forbid his talking, and strictly enjoin the utmost silence and quietude in the room. Urge him to restrain the inclination to cough by the most determined effort of the will; for coughing re-opens the gaps in the bleeding vessels before a firm clot can form to close them, and thus prolongs the loss of blood. No person should be admitted to the room except one or two people who can be sensibly calm, and who will quiet the patient and give him courage by a cool and firm manner.

A simple and valuable article to check these hemorrhages is table salt. One or two teaspoonfuls of this may be eaten within a few minutes; and repeated in twenty or thirty minutes, as needed. Small pieces of ice may be sucked at the same time. The nausea which will be created when large quantities of salt have to be eaten, is of much benefit in lessening heart excitement. Even quite severe attacks will generally be stopped by these means; or at least checked greatly until other measures can be prepared. These

other measures are the astringents, which must be of the strongest class, such as kino, tannin, oak or hemlock bark, sumac bark, beth root. The last article and witch-hazle are of much value, though not strong. Such agents must be made in strong infusion, and a tablespoonful given every three or four minutes till the flow has been checked. Among other articles which may be used for the same purpose are Peruvian bark, wild cherry bark, dogwood bark, poplar bark, cranesbill, bugle weed. The plant fleabane is one of the most potent to effect a prompt diminution of the flow; two to five drops of the oil on sugar being given every twenty minutes, or an infusion employed. Solution of persulphate iron may be used, but is not so desirable as the above vegetable infusions. I have mentioned a goodly list of suitable remedies, and those most easily attainable; and yet a kind Creator has prepared many others.

While keeping the patient absolutely still and using these methods to arrest the flow, divert the blood away from the chest by hot foot-baths. It is next of importance to allay the tickling in the throat so as to abate the cough, for to cough in these hemorrhages is pretty much like blowing the nose in nose-bleeding. A syrup of two parts each bugle weed and cherry bark, one part licorice root, and half a part or less lobelia, is admirable for these purposes, and small quantities may be given every few minutes as needed. Or a little licorice may be eaten, or cherry bark infusion used, to allay the tickling. Lobelia is not to be continued after the attack, unless the heart beats very tumultuously; but a syrup made of four parts bugle weed, two parts cherry bark, half a part each boneset and licorice root, and this used pretty steadily until the heat and oppression in the chest have been overcome by the removal of the clots that are likely to remain at the site of the bleeding. When other attacks are feared, resorting to this syrup will probably avert than for a long time,—bugle weed being an admirable article to arrest the discharge of blood as well as to allay cough.

Persons subject to these hemorrhages should not live in valley sections, but seek an elevated locality. They should lead a very quiet life, free from mental excitement; pursue moderate daily exercise, but not heavy labor nor fatiguing walks; and abstain totally from alcoholics, malt liquids, coffee, and other excitants. And the general strength must be kept up by good tonics, which to some extent should embrace articles of the astringing class,—as a portion of dogwood bark, or American columbo, or Peruvian

bark, or a more considerable amount of wild cherry, with scullcap for the nerves and golden seal for the stomach. Digestion must always be kept good, and possibly some pepsin will be needed to help this. So great is the loss of blood in some cases, that the patient is anæmic ; and then the blood-making functions must be improved by some of the preparations of iron, as enumerated in the formulary. I am partial, for this purpose, to the preparation of maltine with iron, which may be taken with the meal. No form of iron is to be combined with any astringent whatever, for such a mixture makes a sort of ink.

V. *Bleeding from the Stomach.*—Perhaps this might better be called *vomiting of blood*; inasmuch as blood from the stomach is ejected by vomiting almost as uniformly as that from the lungs is ejected by coughing. Such bleeding is due to a large variety of circumstances, being one symptom of various diseases. Among these are yellow fever, dangerous cases of bilious remittent fever, some of the serious diseases of the liver, ulcers or cancer of the stomach, tumors pressing upon the vessels of the stomach or liver, enlargement of the spleen from malarial diseases, etc. Vicarious menstruation may appear at the stomach as well as at the lungs, though not so frequently. Blood from the mouth or bronchi may be swallowed, and afterwards be vomited. In some cases the amount may be very small; in others it is considerable; and rupture of a large vessel may cause profuse bleeding. Very many cases give no warning whatever, but come on suddenly and when not expected, returning without any symptoms to announce them. Other cases herald their approach by trifling chilliness, a sense of warmth at the pit of the stomach, and pain between the shoulders,—symptoms whose meaning is immediately recognized by persons who have once suffered this hemorrhage.

When the flow of blood begins, delicate persons become pale, cool and faint; the robust may have no especial sensations unless the flow is large. A warm and sweetish fluid rises in the throat, and then blood is discharged by an act of vomiting that is usually gentle. Large bleedings cause pallor, dizziness, and perhaps actual faintings; and after the attack the person remains pale or ashy-yellow, exhausted, cool over the surface, with little or no appetite, and possibly inclined to dropsy for months.

Blood from the stomach is usually touched by the action of the gastric juice, which turns it very dark-brown or chocolate-colored; and also clots it so that it looks somewhat like coffee-grounds when

ejected. It smells sour, and may be mingled with food if the attack occur within a couple of hours after eating, but is rarely mixed with mucus. In large bleedings, when the blood is ejected almost immediately by vomiting, the gastric juice may not have time to touch it, and then the ejected blood may be bright-red and not clotted. In from one to three days after the attack, blood may be found in the stools. It is nearly black and clotted if passed early; tarry, black and very offensive if passed late. Some small stomach bleedings show only in the stools and not by vomiting.

Such hemorrhages are to be arrested by astringents that will cause the least nausea,—giving them in the fluid form, small doses repeated every few minutes till relief has been obtained, and then at longer and increasing intervals. Among the best of these are kino, tannin, oak bark, solution of iron persulphate; while beth root, witch-hazle and cranesbill are good. Let the hands and feet be bathed in hot water; to which ginger, mustard or pepper may be added, if the extremities are cold, as they are likely to be. The patient must keep still and observe great quietude for several days after the attack. Afterwards, he should tone the stomach by the milder astringing tonics, as in Class IV., and use only a light and soft diet. Temporary constipation follows the use of the active astringents, and it is afterwards necessary to be careful in the use of physics,—butternut probably being the best, and it will be well to obtain the first stool by using a moderately warm enema containing salt and a little ginger.

As the stomach bleeding is a symptom in such a variety of maladies, its final cure depends on the cure of the other disease.

CHAPTER LXXVI.

CONSUMPTION. PULMONARY CONSUMPTION. PHTHISIS.

CONSUMPTION is a dread malady, familiar to us all in some one or other of its many aspects, and in some localities year by year causing more deaths than any of the acute diseases. Its own history is essentially chronic, beginning insidiously, usually occupying a period of from three to five years before it terminates fatally. Sometimes it runs a more speedy course; a form called "hasty

consumption," which oftenest follows an acute bronchitis, may last but a few months; or it may be combatted so successfully as to be baffled for many years before it finally claims its victim.

Here, as in all other portions of this volume, I purposely lay aside the many and curious speculations that physicians have indulged in, and speak only of the well-known facts connected with the malady.

Consumption consists essentially of deposits, in the membrane of the lungs, of numerous small particles of cream-colored material called *tubercle*. The real origin of this material is not fully understood; but it somewhat resembles half-formed tissues, and may spring from failure of the processes of assimilation, the imperfect substances getting caught in the fine meshes of the weak lung-substance. Its principal and favorite seat of deposit is the upper part of one or both lungs, the left one twice as often as the right; but it may be deposited in the middle or lower parts. Its quantity is exceedingly variable,—at first and in mild cases being sparingly scattered through a section of the lung, later on and in cases advancing unfavorably becoming much more abundant and more closely aggregated. Material of the same character may be deposited in different parts of the body during the course of a consumption history,—as in the larynx and trachea, giving what is sometimes called "throat consumption;" in the bowels, causing diarrhea, etc.

These particles of tubercular matter are small specks, at first soft and afterwards becoming rather hard; and finally softening again. When they begin to soften last, the delicate tissue around them will also soften and break down, and each spot becomes like a miniature abscess with the tubercle as its centre. At this stage the matter seeks to find an outlet or place of discharge, the natural life-processes endeavoring to remove it and to protect the surrounding parts from farther destruction. A small inflammation in these parts is developed; exit is sought by the only possible channel, the air-passages, and the approach of the matter toward these excites a little inflammation there; and then cough begins, although no cough may be present until such time as the softening tubercle reaches the bronchial tubes and causes their irritation. This is called the "first stage" of consumption, and may last a year or eighteen months. When these first deposits of tubercle have softened and been cast out, the irritation abates, the cough diminishes or almost disappears, the cluster of minute cavities left by the

discharged tubercle begin to heal up, and the patient begins to regain the flesh he had lost during the process.

But another deposit of tubercle now commences, decidedly more abundant and extended than the first. It goes through the same course as the first one, with symptoms much more decided. The spots of tubercle being more close together, break down the lung tissue between them; and when they soften and discharge, one or several cavities are left in the lungs. Another year may be taken up in this second round of deposits and destructions, its completion leaving the patient much more feeble than before; and yet at its termination his symptoms may again improve, his cough abate to a considerable degree, and some gain of flesh be made. This stage, leaving distinct cavities in the lungs and decidedly reducing the general vigor, is called the "second stage."

Only a short period of respite is usually enjoyed at the termination of the second stage, unless it be that the proper course of management succeeds in arresting the progress of the malady and promotes the healing of the cavities. Failing to accomplish these objects, a third and still more abundant crop of tubercular deposits begins, crowding more closely together, occupying a much larger area of the lung, destroying tissue more extensively, and continuing the two processes of depositing and softening with only temporary intermissions till death closes the scene. Improvement usually takes place, in each instance, during the milder months; and the oscillations from failure to improvement continually inspire the patient with the hope that he will again rally and finally recover. The hopefulness of these people is proverbial, and they either cannot or will not recognize the true nature or the gravity of their complaint at any of its stages. Hope rather increases as the malady progresses, filling the patient with anticipations of recovery to the latest breath.

During the history of these changes in the lungs themselves, there are lines of symptoms pretty uniformly corresponding to each stage. These symptoms vary more in degree than in character, although the position of the deposits as well as other circumstances will make differences.

Some begin with a poor appetite, sense of weariness on exertion, a little hurry and catching of breath in talking, very slight feverishness in the evenings, and a slow loss of some flesh. Others begin with a small hacking cough, or a hoarse cough and voice, followed after months by weakness, paleness, loss of flesh, feverishness and

possibly night sweats. Weak and disturbed stomach, a little persistent diarrhea, and a somewhat hurried pulse, are present with others. The patients usually have large and prominent eyes, a pearly or transparent appearance of the eye-balls, slender hands and incurved nails. The chest gets lean, the spaces between the ribs get wide, the spaces below the collar bones become depressed, and the shoulder blades stand out prominently.

Feverish feelings finally become quite distinct in the evenings, with flushed cheeks and hot hands; there is slow but steady wasting of flesh, with much dryness and thinning of the skin; loss of appetite increases; and night and morning there is a quite troublesome cough, lighter and yet annoying during the day, with expectoration that is at first light and frothy, and afterwards heavy and yellow. Dull pains are usually felt in the chest, strength fails decidedly and slight exertion causes weariness, there may be distinct chilliness in the forenoon with stronger fever in the afternoon, and after a time profuse night sweats and farther sense of exhaustion. Such is a general picture of the symptoms, which increase and diminish in severity with the fluctuations in the deposits and softening of the tubercle as already described. The breath gradually shortens and the catching during conversation grows more marked; the pulse stands above ninety or ninety-five to the minute, and in time stays about one-hundred and ten; and wasting of flesh goes on steadily from month to month.

Individual cases present varying degrees of severity in all these current symptoms. Thus, cough is severe and distressing in some; in others it is trifling, or may be absent till extensive deposits quite exhaust the patient. Bleeding from the lungs precedes some cases for weeks, months, or years before the real consumptive symptoms begin; but others have no hemorrhage till near the end, and then perhaps but little. Breathing becomes gradually shortened and hurried; but with many is not distressing, while with others it is an almost continuous struggle with loud wheezing and heaving of the emaciated chest, appearing to be a genuine asthma. The word "consumption" is quite expression of the great waste of flesh, which seems to be slowly consumed by the daily fever. Women gradually cease to menstruate; and toward the close the night-sweats become drenching, and there arise dropsical swellings of the feet. Diarrhea is continuous and exhaustive in the latter stages of many cases; there may be ulceration of the bowels with pain and offensive discharges; some are marked by adhesions between the pleuræ

and lungs in their early history, and suffer much from pleuritic pains during its progress; bronchial inflammation is severe with some, but nearly absent with others; and it is not uncommon for fistula of the bowel to develop. If the larynx is attacked, there is persistent hoarseness and at last an almost total loss of voice; and painful ulcers of the mouth are common. The mind remains clear, except in the few cases where tubercle is deposited in the brain; and it is usual for these patients to retain the fullest intelligence up to the latest breath.

Causes.—Consumption is one of the maladies strongly influenced by hereditary tendencies, (p. 100), the constitutional and local conditions favoring it being implanted in many children at birth. The tendency to it may exist in varying degrees, in some developing surely and rather early; in others developing late, or being escaped altogether. Scrofula is closely allied to tubercle; and a scrofulous constitution is often but not always, a condition preceding consumption. A peculiar tendency to faultiness or some measure of failure in the general powers of making nutriment, nearly always precedes the development of the malady in a distinct form; and those who are constitutionally deficient in this power, are most in danger of tubercle.

Those who are most distinctly inclined to consumption from infancy, usually have a peculiar chest formation and other special features of organization. The neck is long and slender, the shoulder points are sloping, the upper part of the chest is narrow and flat, the depth from front to back is shallow, the collar bones stand sharply prominent because of the depressions below them, the shoulders incline to drop forward, the shoulder-blades stand away from the spine and leave a deep hollow between them, and perhaps that portion of the spine inclines toward the breast bone. Such a configuration throws the greater portion of the respiratory act upon the diaphragm, and leaves it correspondingly limited in the upper part of the lungs above the dividing point of the main bronchial tubes,—or above the level of the fourth rib, in which portion of the lungs the tubercular deposits are most abundant. Such persons are also thin in their muscular structures, often to a most unexpected degree even when seeming to be somewhat stout; the neck and chest especially exhibiting such thinness, which further diminishes the respiratory powers.

Let it be understood that such a shape of the chest increases one's liability to consumption; but it by no means makes the dis-

ease inevitable, for many who are thus shaped may effectually overcome the physical weakness and successfully avoid the causes which usually provoke tubercular deposits,—thus living to a good age and never suffering any degree of this malady. On the other hand, persons with the best shaped chests, and absolutely without any consumptive tendencies, may fall victims to this disease through disregard of the rules of personal hygiene, or by imprudences in exposure, etc. Very few indeed have a constitutional tendency so great that it may not be overcome; none are so free from such tendencies but they may establish them.

A large variety of circumstances aids in determining the establishment of consumption, and in hastening it in those who have any constitutional tendencies thereto. It is not probable that one influence alone is at fault, but rather that several conspire to the same end, operating slowly to reduce the nutrient power and nervous energy of the system and thus promoting the one common result. Whatever impairs the nourishment of the body, induces poverty and thinness of blood, and depresses the nervous vigor, may assist in slowly laying the foundations for consumption, extending their influence sometimes for years before the effects upon the lungs are developed. Because of this gradual progress toward tubercle in very many cases, the danger of such influences is commonly overlooked,—attention being given to some special and immediate event as the only cause, while the more sure and fatal causes insidiously undermine the constitution without check. The adverse influences which so many times result in tubercle after years of continuance, may be mentioned briefly:

General vital insufficiency, and protracted constitutional disturbances and maladies that greatly reduce the vigor and activity and the body,—as anæmia and other enfeebling diseases involving the digestive and assimilative organs and the nutrient processes. Continued prostration from affections that impoverish the system, as from diabetes, unusually prolonged whooping cough in delicate children, loss of blood by repeated miscarriages, too frequent confinements, nursing children too long, etc. Climates and localities where the air is filled with too much moisture; prolonged heat and prolonged cold with dampness; long-continued exposures and fatigue, especially if accompanied with mental anxiety; a melancholy disposition, or mental depression and disappointments that sadden the spirits and persistently darken the ambitions and hopes of life. Sedentary pursuits of any and every class,—as in seam-

stresses, tailors, book-keepers, and many others (p. 119), where an indoor life is nearly constant, the position often constrained, and muscular exertion extremely deficient. Living or working in rooms where the daily amount of sunshine is too limited (p. 30), or where the atmosphere is damp and the ventilation insufficient (p. 42). Many classes of workers, especially among women, are peculiarly endangered by the causes named in the last two sentences, and by disappointments with their growing melancholy. Close rooms, close and dark workshops, crowded asylums and barracks, dark and damp houses anywhere,—in the close city or the open country,—crowded tenement houses, low and unwholesome localities, are all directly favorable to the development of consumption. Occupations that expose persons to irritating dusts and noxious gases. Intemperance, debauchery, and even the marital excesses that some think to be their legal right. Insufficient food, or that which is impoverishing in its character,—not supplying the system with a full amount of the different classes of aliment (p. 127), and not presenting sufficient daily variety in the dishes and in the modes of cookery. Even in our own beautiful land, and among people whose means are ample, neglect or thoughtlessness in not using a large variety of foods frequently reduces the system, especially of young people; and so impoverishes the blood as to slowly bring about wasting and half-starvation in the midst of plenty.

The more immediate influences which cause consumptive conditions to start into actual development, are the exposures which lead to colds in some form. When the antecedent influences have been long-continued, and have made a strong undermining impression of exhaustion upon the system, a moderate cold may set into active operation all the changes that lead to tubercular deposits. Where these antecedent conditions have not existed, sharp exposures and quite severe colds will not be likely to make any impression whatever toward consumption. It is well to remember these facts; for it is customary to attach all the blame to the cold, or to the succession of slight colds, whereas the actual foundation of the malady was laid in months or years of some one or more of the depressing influences named in the last paragraph, and the cold merely ignited what those errors had so thoroughly prepared for combustion.

In persons already tending to consumption, bronchitis frequently repeated in mild form, or a single acute attack in severe form, may persist in remaining uncured and finally terminate in tubercular de-

positis. As already mentioned, the rapid course of a "hasty consumption" is usually due to acute bronchitis. Severe pneumonia may also be followed by lung changes that terminate in consumption; and this is so frequently the case that it sometimes appears as if this disease were almost uniformly connected with a low form of lung inflammation. Pleurisy is not likely to cause this malady; yet extensive adhesions following pleurisy, and the effusions of fluid that sometimes take place, will so weaken the lung tissue as to make consumption more probable if there is the least tendency toward it.

The contagiousness of consumption has long been discussed, and many persons believe in it. But such apparent contagion is no doubt due to the fact that those who seem to contract the disease from another are already inclined to it by heredity or by constitution. When such is the case, there is little doubt but that occupying the room or bed with a consumptive is to be subjected to too close an atmosphere and too much melancholy for the other's health; and the faint odors connected with a consumptive's room are also detrimental. By making due allowance for these facts, the apparent contagions can easily be accounted for; and persons of good constitution and sound lungs need have no fear of contracting the disease from another in the sense that measles and small-pox are contracted.

Recently the theory has been advanced, that an animalcule (bacillus) of the smallest proportions, so minute that 120,000 of them end to end are required to measure an inch, is the cause of this disease. It has been found that these bacilli exist in many cases of consumption, and that they do not exist in many others. A single fact of this kind is sufficient proof that the bacillus theory of consumption is nothing beyond theory,—the presence of such animalcules being in consequence of the disease rather than the disease being caused by them. All such extravagant speculations may be dismissed at once.

Consumption causes an enormous waste of life, its victims numbering about one-eighth of the deaths from all causes. It is most prone to develop between the ages of 20 to 25; or between 5 and 8, or again from 30 to 33; but it may appear at any time in life, even in those who are advanced in years. Recovery from it is the exception; yet this is in no small measure due to failure in detecting the malady in its early stages, and in promptly pursuing a judicious course of management before it has made too great pro-

gress. After cavities of considerable size have been formed, only a few may hope to recover; but many may possibly be saved earlier than that. So great is the hopeful disposition of these patients, that they seize eagerly upon the extravagant promises of charlatans—who often dupe the sufferers till the day of rational hope has been lost.

When consumption exists, the chances for its arrest or removal will be increased when the parentage on both sides has been healthy and free from phthisis and scrofula; when the person's chest is reasonably full, and not inclined to the peculiar conformation already described; when the previous general health has been good, digestion sound, life regular and sober. Among the unpromising facts will be hereditary impressions received from either parent, and worse if from both parents; the flat and feeble chest above described; a marked scrofulous constitution; previous poor health, bad digestion, and an irregular and intemperate life. Repeated and protracted bronchitis, pneumonia and pleurisy are unfavorable; so are irritation and sensitiveness in the upper part of the chest after these diseases, or after measles, whooping-cough and typhoid fever. Distinct and prolonged intermissions are much more favorable than when the deposits allow almost no remissions and the feverish pulse continues steadily above ninety or ninety-five.

Treatment.—This is a malady where measures for prevention are much more promising than attempts at cure; and were families wise enough to heed good advice when given, phthisis could be lessened greatly in frequency and rendered far more manageable when developed. Some families are so prone to consumption, that their children should never marry,—unpalatable advice; but advice that, if followed, would prevent untold distress and sorrow. Women are especial sufferers in wedlock; for the child-bearing that is to be expected makes so great a drain upon the limited stock of vitality possessed by persons of this constitution, or by those reduced in general tone by any of the above-named influences which favor phthisis, that disastrous consequences almost surely await her. Such women will assuredly consult prudence if they refuse marriage.

A mother of strongly scrofulous tendencies or inclined to the tubercular constitution, should not suckle her children; as that favors the development of consumption at or before puberty. Only in exceptional cases will a child prosper on the milk of such a mother; yet unwholesome cow's milk, so often served to the poor

of cities, may be even worse than that of the mother, and sometimes comes from tuberculous animals. Children of such parents should have plenty of fresh air and sunshine, for dismal rooms and foul air are the very pabulum of consumption. No hope of a full life can be entertained, if such children are kept in darkened rooms.

With all these people, at every period of life, there is a constant dread of taking cold. Of course colds are sedulously to be avoided; but it is exceedingly unwise to house and coddle and overheat these persons till they become relaxed and sensitive to the most trifling draughts and changes of temperature. Such a course is a decided misfortune, multiplying the liability to the dreaded colds and too frequently determining the future against the person. From infancy through adult life, the aim should be to make the surface firm and accustom the body to ordinary changes. This is not to be attempted by cold rooms, insufficient clothing, and needless exposures without suitable protection for trunk and limbs and feet. Some imagine that to be the way to "harden" children (p. 149); but such procedures are inhuman, and are the sure ways to kill. A child (and an adult also) should be clad reasonably over *all* the body, without being swaddled or burdened in a manner to weaken the surface and keep the pores too open. Clothing should be graduated each day, according to the changes in the weather during the variable portions of the year, so that there shall be no risk of either chilling or overheating the surface. Rooms should be kept at a moderate warmth in cold weather (p. 33), and as equally heated as possible,—excessive heat, which is the common error, being extremely objectionable.

By such methods of hygiene in early and advancing life, many a case of threatening phthisis might be averted successfully. Coddling means killing with this class of people, whether deposits of tubercle have actually begun or are only to be apprehended. Nothing but the fullest possible out-door life is compatible with safety. Huddling about stoves and registers, with doors and windows closed and the atmosphere laden with impurities (p. 40), is one of the great dangers to consumptives,—favoring the deposit of new and extensive crops of tubercles, to which the patient is in danger of succumbing from March to July. It is immeasurably better for all such patients, and for all who may possibly become patients of this class, to be out-of-doors every day. Get the fresh outer air and exercise, almost without regard to the state of the weather, except it be severely stormy. A dull day, a drizzling rain, a brisk

snow storm, are unpleasant and looked upon with apprehension. But the air they bring permeates the house; and one shut in-doors can have but this air to breathe, and added to it the steady closeness of his rooms. Get abroad, even on such days; and if reasonable care be taken to clothe the body, to keep the feet dry, and to have sufficient exertion to maintain the blood in good circulation, there need be no fear of taking cold,—provided he does not return to an over-heated room, or a cold room, or sit down in a draft, or remove the outer clothing too quickly, or retain damp clothing.

Boys of slender frame in whom consumptive tendencies are to be feared, should be led to “rough it” out-of-doors,—walking, hunting, fishing, sledding, climbing, and in all similar ways exercising themselves without undue fatigue. By such a life they toughen muscle and bone, send rich life-blood bounding everywhere through the body, expand the remotest cells of the lungs to the fullest supply of pure air, secure vigorous appetite and digestion, and ensure perfect nutrition and elasticity and power to every tissue.

Girls should imitate the boy life, as nearly as possible. They should wear loose clothing, avoid the needle and the sensational novel, avoid evening parties, and do everything to relieve the mind from morbid despondency and to built up a strong body. The well known case of Harriet Hosmer is a notable instance of what such methods will do for one strongly disposed to consumption. Her mother and elder sister died of that disease, and she herself exhibited unmistakable tendencies in the same direction. Her father, a physician, concluded that “There is a whole life-time for the education of the mind, but the body develops in a few years; and during that time nothing should be allowed to interfere with its free and healthy growth.” While yet a child, he gave her a horse, a boat, bow and arrows, and skates; and for years the slender girl galloped over the hills, rowed her boat, hunted and skated in all kinds of weather, grew strong, and became a healthy and hearty woman of great genius and power. Her case is but one of many; and thousands of women could be saved if they pursued a course similar to that adopted with her. It is immeasurably more important to secure a vigorous constitution, than to indulge in frivolities or even to obtain a certain polished education at the expense of health and life. I have seen more than one woman, in the early stage of tubercular deposit, arrest and finally overcome the disease by removing from a city to an elevated country location, and there

living in a house full of small openings for the wind to whistle through; but never saw such a woman live long in a close or furnace-heated house.

Change of locality is many times a necessity with these persons. To be of service, it should be made early in the history of the malady. Waiting till disorganization has begun, and the patient has become much emaciated and reduced, will usually make such a change unavailing. It will then be expensive and inconvenient, deprive the sufferer of his home comforts, and perhaps hasten the fatal issue by the attendant fatigue and deprivations. If such change is made in good time, life is quite sure to be prolonged, and possibly a complete arrest of the disease be obtained. It is often unfortunate that these patients do not realize the necessity of making the change until it is too late.

Where a consumptive should go, is an important question, and one that cannot always be answered satisfactorily; yet there are several potent factors that will help to guide in the selection of a locality.

Such people must get away from the closeness, bad air and inevitable confinement of a city. Some cities are more tolerable than others, but all are positively objectionable under these circumstances. Valley districts are always bad; and sometimes a valley in the open country is even more objectionable than a city. Any section where the soil is damp, springy and incapable of free drainage, is to be avoided. Some country localities are so flat, clayey, and persistently moist a short distance below the surface, that consumption exists there in abundance and cannot be checked while such persons remain in such positions. Sites which necessitate exposures to damp winds are very objectionable; and hot climates are prostrating.

Elevated positions, where there is a comparatively dry atmosphere and good natural underdrainage to the soil, with suitable protection from north and north-west winds, are the most desirable places to seek. Among these may especially be named the hill ranges of North Carolina and eastern Tennessee; Colorado, New Mexico, and the entire range of table lands on the eastern base of the Rocky Mountains; many locations near the Pacific coast in California; the peculiarly equable climate that can be obtained in the Sandwich Islands. Florida, in such places as are not malarial, is moderately good in winter, but very bad in summer; and is better for chronic bronchitis than for tubercular diseases. Minnesota and

most of the country north and west of it are good for those who are not easily chilled, providing the change is made during the latter part of summer and before cold weather sets in. At one time the lower Mississippi and the West Indies were popular; but they are too moist and debilitating, and hence decidedly objectionable. New England is too wet and changeable. Be the position where it may, the house lived in should stand well up from the ground, have a thoroughly dry cellar and plenty of sunshine, and be provided with a good water-supply. Long journeys to reach a desirable locality should not be made, unless it can be done by easy stages; and many times a suitably healthful spot can be found at a short distance from one's own home.

Exercise is to be provided for all these patients, and in connection with an out-door life so far as possible. Such exercise should be *daily*, and made rigidly regular; but the amount must be graded carefully to the strength of the person, and never on any consideration carried to a point that is fatiguing. With some persons, the amount that can be taken seems to be suited rather to a child than to an adult—a short walk, a limited horse-back ride, a brief carriage ride; but the limit that is exhilarating and not wearisome must be observed, and then the exercise perhaps repeated two or more times a day. Some forms of gymnastics can be made serviceable, especially the trapeze, Indian clubs and dumb-bells, which give strength to the chest and neck muscles. When gymnastics are employed, there is a great temptation to overdo them and thus render them baneful. One to five minutes several times a day, is the true rule by which to guide these exercises and obtain benefit from them.

The diet of these patients must combine the best nourishment with the easiest digestion. Milk, fresh meats, eggs, fruits, and such fatty substances as are most acceptable to the stomach, must be selected as each person is most capable of using. It is well known that many persons, even in health, cannot use milk for any length of time, and the same fact will pertain with many of these patients. All such must put it aside; yet it will be found that some who cannot digest milk and who become bilious on its use, can employ the cream to advantage, finding in it in a very acceptable form the fat that the system needs in moderate quantities. Eggs are admirable for most persons, and especially so when taken raw, provided they are beaten up so as to break the compactness of the whites. Among the fruits, grapes are a peculiarly acceptable article, and

usually may be consumed in large quantities. So notable is this fact, that a "grape cure" enthusiasm was at one time the fashion,—consumptives going to extensive graperies to reside, and there enjoying the combined benefits of out-door life, an elevated position and this luscious fruit. It is the fruit that it is needed, not its juice after fermentation has begun.

It is in such regulations of the life that the hope of checking and curing consumption lies. They should be commenced early and continued persistently,—even after the progress of the disease has apparently been arrested. Very much has been accomplished by them; yet in some instances, even when the lungs have been kept safe for ten and fifteen and twenty years, laxity in those regulations and a return from the proper locality to an improper one have been followed quickly by a retrograde process that could not again be arrested. Medication must be an assistant to this rigid hygiene, and is only of secondary value as compared to these rules of sanitation. There is no medical panacea for consumption, and in the very nature of things there never can be. Whatever assists in improving the powers of nutrition, in sustaining the true vigor of the system, and in allaying the various symptoms as they arise, may be of service. Whatever interferes with the nutrient processes, or impairs digestion, or debilitates any portion of the frame, or attempts to allay any symptom by interfering with the salutary action of the organs, will inevitably do mischief.

The slow loss of flesh that marks the progress of consumption, calls for some measure to supply the waste. This is dependent upon the foods used, and upon the power of digestion. Many persons do well, for a time, upon cod-liver oil, some of its emulsions being the better form in which to use it. It is nutritive rather than medicinal; and while some persons can employ it and thrive upon it for many weeks, its unpleasant taste and smell are so objectionable to others that they cannot use it at all. Usually it is best given in rather small doses half an hour or more after meals, followed at once by some bitter tonic. So long as it does not interfere with digestion, it will be followed by relief to the soreness and cough and more or less improvement in flesh; but must be discontinued if not acceptable to the stomach. So far as this oil is concerned, it is a plain question of supplying the system with some fatty food of digestible character; and for this purpose cream, butter, or other fat is usually much preferable to cod oil.

Many articles are used in promoting digestion and giving better

action to the assimilative organs. Among these are the usual tonics, though these must always be mild in character and used in quite moderate quantities. I am partial to the use of some of the malt preparations to assist in this purpose, as they offer to the stomach nutritive properties that are of great service in advancing the work of digestion. Among these preparations, Trommer's Extract of Malt, and the article Maltine, are probably the best; and a medium dose may be taken just at meal times.

Irritation of the throat and air passages may be met by the Nervine Liniment outwardly, two or three times a day; and by a limited use of any of the mucilaginous drinks already advised for acute bronchitis. Cough syrups in endless forms have been devised; but no such syrup can be more than palliative, and many of them are so relaxing and nauseating, under the plea of their "loosening the phlegm," as to be absolutely injurious. Such articles give a feeling of relief for the time being; but in the long run impair digestion and soften the lung tissue itself, both which effects are the contrary of what is needed. And cough syrups that contain any opium or other narcotic, as nearly all the advertised articles do, may seem admirable because of blunting nerve sensitiveness; but they cripple the life power and destroy any little chance of improvement that a consumptive may have.

One of the more advantageous of the cough syrups is the Compound Comfrey Syrup, to each eight ounces of which there may be added four drachms fluid extract of bugle weed. A good syrup may be made of four ounces spikenard, eight ounces cherry bark, half an ounce each of boneset, elecampane and blue cohosh, made into a quart of syrup. It is usually an excellent plan to use an ounce of glycerine to each pint of these cough syrup. As the protracted nature of the disease causes the stomach to weary of any one preparation, it is usually necessary to change from one to another of them. And I have always found it a good plan to employ some astringent in them, or use one three times a day separate from the cough syrup and in company with the tonic that is being given. Astringents often cause the expectoration to be less free for a time; but some of them do not do this to any material extent, and have the advantage of acting as a tonic on the tissues. Among the best of them are cherry bark and bugle weed, as already mentioned; and gum kino and tannin, in small quantities, are sometimes admirable. The Hoarhound Syrup may be used for the same purpose, especially if the breathing is not asthmatic.

Expectoration may become excessive and then be exhaustive; and the astringents anticipate this, and must be used regularly if it occur.

The fever of these patients naturally engages considerable attention, and causes anxious efforts for its relief. But it must be remembered that this fever is a nerve symptom, and will be relieved only as the general management improves the condition of the lungs and betters the state of the system at large. Sweating medicines of any class are not to be employed, for they aggravate the night sweats and still farther increase the weakness.

Night sweats are in a measure relieved by dry friction with a coarse towel; or by rubbing upon the surface a fine powder of beth root or poplar bark, and following with friction. Astringent remedies, as alluded to above, often prevent or allay these exhaustive sweats. Cold sage tea at bed time is an old family remedy, and a good one; but moderate doses of dogwood or poplar bark, or kino, or tannin, may be used for the same purpose. Diarrhea is best checked by the astringing tonics, as elsewhere directed for chronic diarrhea.

The question of medicating the throat and lungs directly by spray and by inhalation, is one that has been much discussed. At one time it was supposed that treatment by inhalation was the only proper course, as this brought the remedies directly to the place where they were needed. But this was to lay aside the great fact that failure in the nutrient processes is at the foundation of all tubercular processes; and that these must be arrested and cured from within, and cannot be influenced to any great extent by direct medication. If the general state of the system is first improved by the methods above directed, then suitable remedies may be used by inhalation and benefits be derived from them; otherwise inhalations and sprays are of no value, except when the throat is sore and the same course is followed as in chronic laryngitis. An attempt to supply the supposed *chemical* wants of the lungs by syrups of the hypophosphites of lime, soda, potassa, iron, etc., is a bit of speculation, and has been found of no value notwithstanding the loud praises from time to time bestowed on these articles. Their sale is much more profitable to the dealer than their use is to the patient.

CHAPTER LXXVII.

WHOOPING COUGH.

WHOOPING COUGH is a convulsive or spasmodic cough that occurs especially among children, and is of a distinctly contagious character. Occasionally an adult has it, and then in severe form. It rarely afflicts the same person twice in life, yet does so at times. Its progress is slow, occupying several weeks or months. Frequently it occurs as an epidemic.

Symptoms.—It begins with the ordinary symptoms of a cold and a slight irritation of the bronchi, and cannot be distinguished from any common cold. There are a little feverishness, sneezing, a troublesome cough, sometimes redness of the eyes and sensitivity to light. Such symptoms commence about six days after exposure, and continue for a week or two without any material change except a gradual increase in the severity of the cough. This comes on in paroxysms several or many times a day, each paroxysm lasting from one to several minutes, and most frequently preceded by a few moments of various peculiar sensations which unpleasantly warn the child of its approach and cause him to run to his mother or nurse for comfort and protection.

It is a spasmodic cough, with a succession of short and rapid expiratory acts that are almost without intermission, and which make it difficult or impossible to draw in the breath during their continuance. A fit of this kind is quite exhaustive, and causes the face to flush in most instances; and in advanced stages the struggle for breath is so great as to protrude the eyes and cause the face to turn dark purple from the enormous crowding of blood in it. As the severity of the paroxysms becomes greater, the child seems about to suffocate, but finally "catches its breath,"—drawing in the air through the narrowed passage with a peculiar piping or "whooping" sound. It is this sound which gives the disease its name, and there is little certainty in determining it till this spasmodic cough begins. It is nearly universal, after a couple of weeks, to have this whooping; but some cases never "whoop," although the paroxysmal cough and the great difficulty in getting the breath are never absent. A paroxysm ends by the ejection of a moderate quantity of white and exceedingly tough phlegm, which becomes thinner and more transparent (or even yellow, as pus) in the later weeks of the disease. Not unfrequently the child vomits at the

same time this phlegm is ejected. In a few moments the coughing ceases, the child is pale and exhausted for a time, and then is relieved and goes to its play until another paroxysm occurs after some hours.

Fever usually disappears after ten to fourteen days. Protracted attacks in feeble children leave them much exhausted, pale, with enfeebled digestion; and in some rare instances such exhaustion may terminate fatally. Various complications may arise in the course of the disease. (1) Disorders of the bowels, with loss of appetite, foul breath, swollen abdomen and offensive discharges; and these, if unrelieved, may gradually pass into a species of remittent fever of a very low grade, with emaciation and serious prostration. (2) Bronchial catarrh or pneumonia, especially due to carelessness and exposures when the disease occurs during the cold months. Such complications advance slowly, but are always serious; and sometimes they terminate in consumption. (3) Occasionally a blood vessel bursts in the brain during a severe coughing fit, and the child dies of apoplexy. This is very rare. Children who are teething are liable to convulsions. While whooping cough is by no means a dangerous malady in itself, one or another of these complications may arise because of a feeble constitution or as the result of carelessness; and then they give a thoroughly serious character to the case, perhaps terminating fatally many months after the whooping cough itself has ceased.

Treatment.—Mothers generally believe that their children must have whooping cough, anyhow; and hence are unwisely willing to expose them to the contagion. Better preserve them from it, as long as possible, by all reasonable caution; for the more advanced their years the less their danger, and if it can be escaped in fall or winter, it will be less protracted if taken in spring or summer. While very seldom a serious malady, it is full of distress to the child; and a tender mother will do all she judiciously can to delay that distress if it is really inevitable, and to make it as light and brief as possible when it does come. Better shorten it within its usual six weeks course, than protract it to twelve or twenty weeks.

Hygiene is invaluable with these little sufferers. They must be kept warm; and the limbs, chest and throat must especially be covered with extra garments. Chilliness of the surface increases the severity of the malady and the frequency of the coughing fits; therefore these children must be carefully housed, not permitted to go out of doors at all in cold and rough weather, and when per-

mitted to go out in mild weather must return to the house before the cool of the evening. Quite ordinary exposures greatly increase the liability to bronchitis or pneumonia, and the precautions against such complications cannot be too strict. Even when the whooping cough has nearly passed away, a thoughtless exposure may cause bronchial irritation to spring up anew, and a week or two of trouble follows.

It is also desirable to regulate the diet of these children, lest the weakened stomach be overtaxed and serious diarrhea developed. Only light and plain foods should be allowed, and these in moderation and with scrupulous regularity. A nervous irritability exists, and the stomach is likely to crave foods it should not have and to eat too frequently. A mother needs to be judicious and firm on these points.

The cough itself is largely due to this nervous irritability, and a trifling excitement may start a coughing fit. It is advisable to keep the child from causes of excitement, and divert its attention from its cough when possible. All nervous coughs can be checked or moderated by a strong effort of the will made before the coughing fit begins; and whooping cough can be moderated in the same way. But a little child knows nothing of such efforts, hence the parent must render what assistance is possible when the coughing fit is seen to be coming on. German mothers, Dr. Niemeyer tells us, frequently succeed in this by threatening the child with the rod; but it is far from being necessary to add this fear to the child's sufferings, at a time when it rushes to a parent for comfort. Good tact in turning a child's attention quickly and sharply to some other object, will on the instant engage the nervous system in a direction other than towards the impending cough, and thus save it from many a paroxysm.

Common cough syrups have no influence on this disease. A suitable cough preparation may be made of a very strong syrup of chestnut leaves, using a pound of the leaves in a pint of syrup; and to this quantity adding about two ounces of the tincture of black cohosh, evaporating the alcohol in this at a gentle heat so as not to injure the good qualities of the cohosh, and then a teaspoonful of cooking soda. A teaspoonful or more of this may be given at a dose, and repeated at intervals of two to five minutes when a coughing spell is seen to be approaching; and between the paroxysms it may be given every hour or oftener, according to the frequency of the spells. Fluid extract of chestnut leaves can be had of good

druggists, and four ounces of this in ten ounces of simple syrup and two ounces black cohosh tincture, will make a suitable preparation. Lobelia is a powerful article to add to this, an ounce or less of the tincture to the pint of syrup; but its taste renders it difficult to give it to most children. In the absence of chestnut leaves, a reliable syrup may be made of two parts lobelia and one part black cohosh, flavored with essence of anise. Better add the tinctures to simple syrup, and then evaporate the alcohol; finally adding a teaspoonful of cooking soda to the pint of syrup.

Between the coughing paroxysms, give the Syrup of Cherry and Spikenard with the above syrup every hour, as this will soothe the bronchi and allay irritation, thus lessening the frequency of the coughing spells. The child may also drink as freely as it will of a tea of flaxseed and ginger with a very little licorice. If the coughing fit is not followed by full relief, but leaves heavy mucous rattling in the chest, an occasional emetic should be given promptly. For this purpose, the use of common alum (see list of remedies) is one of the best emetics to dislodge the phlegm and prevent its rapid formation. If lobelia is used for an emetic, it should always be combined with an astringent.

Failing appetite needs to be sustained by such mild tonics as camomile and poplar, or the Nervine Tonic. Any appearance of diarrhea must be met promptly by thorough regulation of the diet; and by the use of compound bayberry syrup with neutralizing cordial, and outward stimulation, as directed for that affection. Diarrhea is a serious complication in whooping cough, and admits of no delay. The same is true of any signs of bronchitis or pneumonia.

CHAPTER LXXVIII.

CROUP. INFLAMMATORY CROUP.

CROUP is one of the terrors of mothers during the earlier years of their children, and their dread of it is well founded. I here speak of true croup, with fever and inflammation. A disease with some similar features, spasmodic or false croup, which will be described in another chapter, is by no means accompanied by the dangers that belong to the inflammatory variety.

Croup is almost exclusively a disease of childhood, seldom occurring after the twelfth year, yet occasionally appearing in a severe form during advanced life. Boys are much more subject to it than girls, possibly because of their more vigorous habits and fuller blood. Fleshy children suffer much oftener than those of spare build; and some families are much inclined to it, while in other families it may never occur. It usually appears during the fall months; and some sections present a great many cases, but it is in no sense contagious. It is called by the various names of "choke," "hives" and "stuffing."

Symptoms.—It begins with the common signs of a cold or catarrh, with mild feverishness, fretfulness, a somewhat hoarse cough and hoarseness of the voice. These symptoms increase steadily; and by the second or third night (perhaps during the first night) the child awakens suddenly and in a fright, coughs with alarming hoarseness, complains of a bad feeling in the throat, perhaps clutches at the throat, is flushed in the face with the eyes bloodshot, wants to sit up or to get out of bed, and usually is disposed to cry.

From this sudden beginning, a severe case is likely to develop its worse symptoms quite rapidly. The fever increases; breathing gets difficult, and the inspirations are prolonged, and accompanied by a shrill and loud sound likened to breathing through a brass tube; the cough returns in paroxysms, is very dry and increases in hoarseness; the face looks puffed, and the reddened eyes look bright and dry. Irritability and restlessness get rapidly worse, the child tosses about wildly and clutches at its throat, the head is thrown back so as to admit air more easily, the voice gradually loses force and sinks to a mere whisper. From two to four days may be occupied in this history, the child at first getting some relief during the latter hours of the night and part of the day, but the symptoms finally becoming continuous. The difficulty of breathing becomes more and more severe, till every breath is obtained with a great struggle and the danger of death by suffocation is imminent.

During this history, the larynx is inflamed and swollen, its thickened mucous membrane narrows this passage and spasms of its muscles increase the difficulty of getting breath. A peculiar feature of this inflammation is the formation of a tough membrane in the larynx, and even downward in the trachea. This membrane varies in thickness from a mere film to a dense structure of an eighth of an inch or more; and its presence gets to this disease the

name of Membranous Croup. Some persons are apparently more inclined to its formation than others; in them it may be ejected and relieve the child immediately, and then form again and again; while in some severe cases it seems not to form at all.

If relief is not soon obtained from the severe symptoms last named, the danger of suffocation is very great. The face becomes pale or livid, and cold; the extremities get cold, the whole surface clammy, the pulse small, the patient may become drowsy or stupid, vomiting may occur, and the croupal sounds become a low hissing, convulsions may set in, and from time to time the little sufferer springs up to struggle for breath and then sinks back exhausted. Most fatal cases die on the fifth day; but it is possible for death to occur on the third or even the second day.

Treatment.—It is necessary to treat inflammatory croup with great vigor, and not to be deceived by an abatement of the symptoms; and the medicines used should be given in about twice the quantity usual for a child of the same age, and repeated at short intervals. Apply over the throat a mixture of equal parts lobelia tincture and nervine liniment, then apply a soft cloth wrung lightly from tepid water, and cover this with oiled silk or a dry towel. Renew the liniment every four or three hours. Give a warm tea of four parts white root, and one part each ginger and lobelia, using every fifteen minutes or oftener till nausea and relief have been obtained; and then as often as needed to keep up a light perspiration and a little nausea. Keep the room at a moderate warmth, and avoid that overheating and oversweating which weaken. Cover moderately. Move the bowels with senna and rhubarb syrup, castor oil, or other prompt physic. If everything progresses favorably, keep the child in-doors for several days, allow only a light diet in moderate quantities, and increase or diminish the frequency of the above tea according to the symptoms. For the cough, use the Syrup of *Prunus* and *Spikenard*; or a mixture of tincture lobelia and tincture black cohosh each half an ounce, glycerine two drachms, a small piece of black licorice, and enough plain syrup to make up four ounces.

But while many cases will yield to this management, severer cases demand more vigorous measures. Lobelia must be pushed rapidly till vomiting is obtained. It may be given in the above infusion, and a little blue cohosh added. Vomiting thus obtained will usually cause the membrane to be thrown out, and the child will be relieved at once. Then this infusion with the increased

amount of lobelia is to be given in quantities sufficient to keep a very little nausea; when vomiting may again be excited easily on any return of the severer symptoms. Such emetics are marvellous in their power to secure relief. They are not necessary in moderate cases, nor unless the signs of suffocation are marked and the act of out-breathing is rather prolonged; but then they are simply invaluable, and cannot be used too promptly. No article known to man is at all equal to lobelia for efficiency and for absolute safety. Emetics of alum are sometimes given and are often effective; but lobelia with some stimulant is always best.

Applications to the throat are to be made as before. If the patient become drowsy, lobelia is to be given with composition tea, as a strong stimulus is then demanded. Hope is brightest when the early treatment is thorough and not delayed; for any case that reaches drowsiness is exceedingly doubtful, yet may possibly be saved.

CHAPTER LXXIX.

SPASMODIC CROUP. FALSE CROUP.

As stated in the chapter on true or inflammatory croup, there are decided croupal signs without inflammation or the formation of a false membrane. It is common enough in young children, especially during the period of teething; and some hysterical women suffer a peculiar barking cough and crowing voice of the same character, as described in my WOMAN'S BOOK OF HEALTH.

Attacks usually come on in the night after the child has been asleep, the patient waking up suddenly and struggling for breath. In light cases there are whistling or half-crowing inspirations for a few minutes, and then the excited child becomes quiet and falls asleep. In more severe cases, the inward breathing is accompanied by a shrill whistling sound; the child seems in danger of immediate suffocation, struggles and turns livid; and the evidences of terror are palpable, respiration in some cases being actually suspended for a few moments. This alarming struggle continues but a short time, when the child suddenly becomes easy and in a few minutes is asleep.

Such attacks may be preceded by some restlessness, and probably by some irritation and disorder of the bowels ; but there is no fever and no inflammation in the throat. It is a purely spasmodyc affection of the glottis, generally provoked by some bowel disturbance or by over-eating. It usually occurs but once in a night, but may return twice or more the same night ; sometimes returns every night for some time, or may appear only at intervals of greater or less length. In many instances other light spasms accompany it, as of the bowels, hands, feet, fingers, toes ; but the alarm over the breathing usually prevents attention from being paid to these unless they become severe. It may prove fatal, but is by no means as dangerous as at first sight it appears to be. It totally lacks the fever and inflammation and continued strangling of true croup.

Treatment.—Nothing is so prompt in affording relief, as syrup or tincture or infusion of lobelia. It should be given in small quantities every few minutes till nausea is produced. If it incite vomiting, so much the better; but it is most probable that the paroxysm will be broken before vomiting can be induced. It is necessary to act vigorously ; and the child must be taken in hands firmly and the medicine put well back on the tongue, a quarter or half teaspoonful at a time, at short intervals. In a family where this form of croup has appeared, some good preparation of lobelia should always be kept ready,—as the vinegar syrup with one-fourth part tincture of black cohosh. If spasm of the glottis is so great as actually to arrest breathing for the time being, the child cannot possibly swallow in this state ; and to put fluid in its mouth then is to endanger strangulation when respiration returns and the child draws in its breath. First re-establish breathing by suddenly dashing a little cold water on the face and chest, quickly and sharply slapping the chest and buttocks, lifting the arms well above the head, and plunging feet and hands in hot water if any is obtainable. These things must be done rapidly, for breathing can usually stop but a couple of minutes without stopping forever. Fortunately these suspensions of breath are rare and can generally be overcome in a little while ; and then the above course is to be followed.

To prevent the return of such attacks, move the bowels with Neutralizing Cordial, or this and butternut syrup together. Allow only a plain and light diet ; and improve digestion by the Nervine Tonic or similar mild bitter, which will be best given by infusion, and probably some Maltine at meal time. A full dose of Neutralizing Cordial two hours after meals, is usually advisable to relieve

acidity of the bowels ; for most of these cases are provoked by such a state of the bowels with poor digestion. If worms are present, they must be dislodged. Such children must be prevented getting chilly in cold weather.

CHAPTER LXXX.

HAY FEVER. HAY ASTHMA.

THIS strange malady of the summer months has become quite prevalent of late, and seems to be on the increase. It attacks mostly those in middle and advanced life, and only occasionally the young ; and once it has laid hold on a person, it is likely to return to them at the same time each year. With some it begins in June ; with others in August or September ; and it is pretty sure to continue its course each season till the advent of sharp frost, when it ceases suddenly.

Symptoms.—They combine a high grade of catarrhal symptoms with strong asthmatic breathing, the degree of each class being more or less varied. The catarrhal symptoms begin with tickling in the nose, followed by violent sneezing, swelling of the membranes, and a profuse discharge of varying characters. Later the eyes suffer a burning sensation, get red and swell, and there are neuralgic pains in the eyeballs, a discharge, overflow of the tears and puffy lids. The mouth, fauces, throat and bronchi suffer similar feelings, with soreness and annoying cough, and constant distress. Asthmatic breathing differs much in degree, and many times is exceedingly severe and distressing with a painful sense of impending suffocation. It is most severe, as a rule, during the daytime.

During the continuance of the attack, the patient is an object of pity, being in constant misery. He is wakeful, suffers various neuralgias, has slight feverishness alternated with chilliness, and is exhausted and wretched.

The cause of hay fever is a matter of speculation, but is generally believed to be the irritating pollen of various plants. Occurring during hay time in England, it was believed to result from the pollen of timothy grass filling the atmosphere and irritating the nostrils and air passages ; hence its common name of hay fever.

Other plants yield a similarly exciting pollen, among which may especially be mentioned the ragweed or bitter weed ripening in August and September, the gladiolus, and *loli um italicum*. It has been pretty definitely ascertained that the amount of pollen grains present in the atmosphere, bears a relation to hay fever,—the severity of the attacks increasing with the increase of pollen. The malady disappears at sea and in mountain positions, where no pollen is found in the air; is more frequent inland than at the sea shore; is less violent in rainy years, when the fall of water carries down the pollen; disappears when a sharp frost has killed the plants and their pollen; reappears in patients who have gone to the mountains for relief but return to their home before heavy frosts.

But there must also exist a peculiar susceptibility to it in the person. All breathe the same pollen-laden atmosphere, yet only a limited number suffer hay fever. This susceptibility grows with one's years, young people very rarely suffering the disease. As in other asthmas, the nervous system suffers great disturbance; but whether or not some particular state of the nerves determines an attack of hay asthma, is not known.

Treatment.—By changing one's residence so as to get beyond the clouds of pollen and enjoy the purer atmosphere of some mountain position, immunity may be enjoyed if the sufferer remain there until cold weather kills the plants at his home. Many thousands make such an exodus each year, but all have not the pecuniary ability to do so. Those who remain at home should keep themselves in cool and darkened rooms, sustain the nervous system by the use of scullcap and some blue cohosh, and hold up digestion with golden seal or other tonic.

Local medication has been quite unsatisfactory, persons differing greatly in the effects wrought on them by any given medicine. I have had some prosper on the smoke of camomile, others of rosin weed (compass plant), while these or any smoke is exceedingly aggravating to others. A spray of two grains bisulphate quinine and half a teaspoonful of salt in four ounces of water, is advantageous to some; while many are benefitted by a spray of any strong astringent with a little dioscorea.

CHAPTER LXXXI.

FAINTING. SYNCOPÉ.

FAINTING depends upon failure in the action of the heart, in consequence of which the amount of blood in the brain becomes suddenly deficient, and the entire nervous system and the respiratory organs are disturbed and reduced in their action. Its occurrence depends upon a large variety of causes,—young persons, the female sex, a highly susceptible nervous system, general weakness or exhaustion, and an impoverished condition of the blood, being circumstances that predispose one to it.

Among its direct provoking causes, the most common are sudden and strong impressions upon the nervous system, as fright, joy, grief, or other strong emotion; unpleasant sights, as of blood, or of an injury to himself or to another; and even unpleasant sounds and odors will cause faintness or actual fainting in some peculiarly sensitive and overwrought persons. Too prolonged waiting for food or fasting, exertion on an empty stomach, eating too heartily and rapidly when very hungry, may provoke it; and disagreeable or indigestible food occasionally does the same. Severe or prolonged pain, the shock caused by an injury, blows or other violences over the pit of the stomach, are among the common causes. Decided disturbances in the balance of circulation, as long continuance in a hot bath or in hot and crowded rooms, may leave the heart deficient in blood and so disturb the nervous system as to induce fainting. Diseases that weaken the heart give a decided tendency to this trouble, as typhoid and other low fevers, consumption, loss of blood, debility from prolonged suppuration, anaemia, cancer, etc. It is also a probable accompaniment of organic heart diseases.

Fainting may occur instantaneously and without any warning; but usually there is a brief period during which a series of symptoms pass rapidly over the patient. He feels dizzy, weak, a little sick at the stomach, cool over the body but heated in the face, confused, objects become dim to him, noises sound in his ears, and he breathes hurriedly or with sighing respirations. At the same time he looks pale and pinched, the pulse is weak and somewhat irregular, and a cold moisture may start upon the forehead and other parts of the face. An attack may pass off with these unpleasant feelings, the person being languid and weak for some time, yet the full stage of fainting not be reached.

When complete fainting takes place, the person loses all consciousness and sinks down helpless. He is deathly pale, cold and clammy; the pupils are dilated and insensible to light; the pulse is slow, weak and irregular; the beating of the heart in the chest is feeble, and may not be felt at all; breathing is very slow and quite irregular; slight twitchings are not uncommon, and there may even be spasms. In prolonged and severe faintings, there may be involuntary discharges from the bowels and bladder. Such conditions usually last but a few moments, but may be continued for some minutes. Usually the patient begins to rally by catching a gasping breath or two, consciousness soon returns, and the movements of life are restored; but there is a probable season of palpitation and uncomfortable weakness.

Brief fainting in the young and susceptible and hysterical, is always unpleasant but not often dangerous. If prolonged, it may become decidedly dangerous. When it occurs in typhoid fever or other prostrating forms of disease, in anaemia or after hemorrhage, it is always alarming and may cause death in a very few moments. On this account, such persons should make no exertions in bed, and not even rise to a vessel for the natural evacuations; as a small effort may make too great a demand upon the weakened heart, and cause instant death.

Treatment.—Place the patient on his back with the head low; loosen quickly all clothing about the neck, chest and waist; throw open doors and windows to admit plenty of air, and fan him *very gently*,—rapid fanning often blowing away his breath as a gale would that of a well man. Sprinkle cold water in the face in small quantities but by sudden and repeated dashes. Apply somewhat near to the nose vinegar, or smelling salts, or hartshorn (ammonia). Rub the limbs *upward* (toward the heart) firmly and briskly with the hands or coarse towels, and apply friction over the heart. These things must be done quickly, several persons assisting; and they will usually terminate the fainting spell in a few minutes.

In protracted cases, where the previous condition of the person suggests that fainting may become exceedingly dangerous, it is necessary to take prompt steps to stimulate the heart's action. If the patient can swallow, give very small doses of any good stimulant,—a few drops every half minute or minute. For such purpose, use ginger infusion, essence or tincture of ginger in water, tincture of cayenne with tincture of lobelia, compound tincture of myrrh (No. 6), or any similar article. If he cannot swallow, be as

prompt as possible in giving a quite large portion of any of these articles by injection, diluted with six or eight ounces of water. At the same time apply tincture of cayenne or the Stimulating Liniment over the heart, and on the wrists over the arteries, and rub these parts briskly *upward*. If no other stimulus is at hand, a few drops of the Stimulating Liniment, or the Nervine Liniment, may be diluted and given inwardly. After such faintings, care must be taken to prevent their repetition by keeping the patient exceedingly still, and building up the system by the appropriate treatment.

CHAPTER LXXXII.

EXHAUSTION OF THE HEART.

SEVERE and prolonged exertion may throw such a strain upon the heart as measureably to exhaust its power, as any other muscular organ may be exhausted. Being forced to perform too much work, it wearies; and there follows a period of over-sensitiveness, palpitation that fluctuates during repose and increases during slight exertion, and a quickened movement that is nearly continuous. These symptoms may continue for months, or possibly for years, and they closely resemble those of organic heart disease, may unfit the person for labor, yet are not liable to cause death, and finally disappear under a proper course in life. It is, in one sense, a "strain" of the heart.

Soldiers who have been forced on long and rapid marches, carrying accoutrements which compress the chest and restrict the free movements of the heart, are liable to this form of exhaustion. Boys, and even girls, during the growing years of life (10 to 15), may incite the same difficulty by running violently, and especially if up-hill. Anæmia, by its general weakening of the frame, also lowers the power of the heart and brings on a condition similar to heart exhaustion (Chapter IV), which also disappears as general strength improves. Persons who are long over-worked at any manual occupation, those who are persistently under-fed or fed on a repellent sameness of food, and those who suffer long from mental worry, are also liable to a form of heart exhaustion and gradually develop the symptoms above described.

In all these cases, quietude will effect relief in due time. Exertions must be light, and carried only to such a degree as will be agreeable without increasing heart action materially. The mind must also be left at rest, studies and business taxations and literary pursuits being dropped. An out-door life, and a good but easily digested diet, will be necessary.

CHAPTER LXXXIII.

PALPITATION OF THE HEART.

OVERACTION of the heart, or excitement that causes it to beat violently for a time with unpleasant sensations, is a disturbance of the *function* of this organ, but is far from being *organic* heart disease. Many people give themselves great uneasiness and suffer constant alarm, under the belief that this palpitation is genuine heart disease that may prove fatal at any moment. Women are most likely to suffer such apprehensions. I have met a number of such, who lived in hourly fear of death, shut in-doors and taking no exercise, and for months or years pursuing the very mode of life which increased nervous susceptibility and added to the palpitation. True organic disease of the heart is a sad thing, and cannot be soothed too carefully; but simple palpitation may spring from a variety of causes, and is not dangerous unless unusually prolonged.

Such palpitations are due to influences of different classes. Most of them are purely nervous or sympathetic, as in hysterical females, those troubled with neuralgia or St. Vitus' dance or epilepsy, anaemic people, female prostrations with leucorrhea, full-blooded and fleshy people, in women through the years connected with or following the "change of life"; and it may also be caused by the nervous weakness brought about by the use of strong coffee or tea, alcoholic drinks, tobacco, the opium habit or the persistent use of any narcotic, by excesses in venery (lawful or unlawful) and by self-abuse. Mental depression may develop it.

Indigestion is sometimes attended with palpitation, which may become quite severe. In such cases it is usually worse for a time after meals. Sometimes an irritable condition of the bowels may excite it,—as the presence of indigestible substances or of worms.

Persons who have suffered from rheumatism or gout are liable to such palpitations, and it may become serious with them. Exhaustion of the heart, as described in another chapter, is also accompanied by palpitation.

Symptoms.—Palpitation not connected with organic disease of the heart usually comes on in paroxysms; and these paroxysms come suddenly and may cease suddenly, lasting a few minutes, or half an hour, or an hour or more. Their return is very uncertain,—with the dyspeptic returning after nearly every meal, with the young and delicate occurring mostly at night after retiring, in nervous young women returning at some uncertain time every day, in some people occurring at intervals of days or weeks. Moderate exertion often relieves it, especially in the nervous and dyspeptic. In these particulars, it does not resemble the palpitation of organic disease.

During an attack, the heart beats with great rapidity, reaching 150 to even 175 per minute, and in some instances having ran up to more than 200. Its impulse against the walls of the chest is not often strong, but rather short and with a sort of "wagging" feeling. In stout and full-blooded people, the face is likely to flush, with a feeling of heat spreading upward and some dizziness and headache. In delicate persons, the pulse is small and weak, and the person is pale and cold and may have feelings of faintness. Many have a feeling of distress (not often pain) about the heart, a sensation as if it were about to jump out of the throat, humming in the ear, hurried breathing, inability to catch the breath, dimness of sight, a dread of impending death, and various other unpleasant sensations,—which are nervous in character and not constant. Sometimes, among dyspeptics, there is great and sudden distension of the stomach and bowels with flatulence; and frequent sighing is common. An attack usually passes off rather suddenly, there being a profuse discharge of pale urine and some exhaustion.

Treatment.—During a paroxysm, let the neck and chest be loose from tight clothing and moderately bared, and the patient should sit or lie down upon the back in a gentle current of air. A mild stimulant or nervine may be given in small quantities every few minutes, such as essence of ginger, with dioscorea or lady slipper; or tincture assafoetida, or blue cohosh tincture or infusion, or compound tincture of myrrh and essence of peppermint diluted. If the extremities are cold, bathe them in hot water;

and if the pulse is small and the surface pale, give composition tea, or a larger amount of ginger with the myrrh compound, and bathe the chest over the heart with Nervine Liniment.

Between the paroxysms, or for general management, the treatment must be according to the conditions that provoke the trouble,—as for dyspepsia, anaemia, nervous exhaustion, hysteria, rheumatism, or other condition present. Ladies about the “change of life” must pursue the course directed in my WOMAN'S BOOK OF HEALTH. The liver must be kept in steady action all the time, and no constipation be allowed to exist. A dread of organic heart disease is likely to seize these people, and so they remain in-doors and fail to take any exertion; but they need to live much out of doors, and to take a regular and pretty full amount of exercise every day. Mental excitements, tight clothing, tobacco, alcoholics and other injurious things are to be forbidden.

CHAPTER LXXXIV.

ORGANIC DISEASES OF THE HEART.

By organic disease is meant those affections in which some portion of the heart is changed in its structure. The change may be in some part of the muscular walls or body of the organ, as in their thickening, thinning, stretching, or by short lines of fatty structure here and there taking the place of the muscular fibre. It may be in the valves which close the passages from one to another of the cavities, or from the heart to the great artery (aorta). Or it may be in the membrane that lines the inner surface of the heart cavities and their valves.

Such organic changes occasionally begin in early life, but are much more frequently met after middle life, and men are more subject to them than women. They progress very slowly, often in a mild form occupying many long years. Their causes are many. Among them may be mentioned acute rheumatism, which may affect the valves and their lining; heavy straining, forcing the heart walls; the use of tobacco, which is probably the most prolific of all causes in men; general increase of fat in the system finally touching the heart. But very many times no adequate cause can be discovered. In all cases, organic diseases are very distressing when

strongly developed; and the great disturbance they cause at the centre of circulation, of necessity disturbs the entire circulation. Death is frequently, but not always, sudden,—the action of the heart finally ceasing in a few moments, after years of gradual progress in the heart changes.

The *symptoms* caused by organic heart diseases will differ according to the particular nature and seat of the changes. When the walls of the organ are thickened, the movements of the heart gradually become increased in force, beating against the ribs so strongly as at times to make the chest and even the trunk to jar with each stroke. The pulse is large and strong; and there will usually be some dizziness, headache and difficult breathing under excitement or exertion. Such persons look well, and may live long if at all careful.

Dilation of the organ without thickening of its walls causes weak action, general failure of the strength, pallid and mottled countenance, chilly surface, distressing and nearly constant asthmatic breathing, a dry and harassing cough, small and feeble pulse, and distressing palpitation on moderate exertion. This palpitation is quite unlike the nervous forms of palpitation described in another chapter. Persons in this condition finally have a dropsical state developed, and are likely to die suddenly by a form of fainting.

Disease in one or other of the several sets of valves is more common than the other organic changes. It leaves the valves attacked liable to incomplete closure; whence the blood is likely to regurgitate and the circulation to become incomplete. The arteries of the neck throb violently, dizziness and headache are common, the face is pale or bluish, shortness of breath becomes distressing, cough is very harassing, and slight exertion increases all these symptoms. These sufferers may be wholly unable to lie down for weeks together, when the difficulty has advanced; and the obstruction to the circulation interferes with the liver and causes a jaundiced appearance, deranges the kidneys greatly, gives violent attacks of asthmatic breathing and struggles for breath, and finally causes large dropsies of the limbs gradually creeping over the whole body. Such persons suffer greatly for years, and at last die instantly.

Fatty changes in the heart occur slowly in some persons who develop a large amount of obesity after middle life. The heart changes themselves give no particular symptoms beyond a soft and rather slow pulse, and a disposition to faintness upon moderate exertion.

Inflammation of the covering and lining membranes of the heart may occur during inflammatory rheumatism, and will be spoken of in the chapter on the latter disease. As organic diseases are very likely to give palpitation, it becomes a chronic source of dread with some people that every trifling palpitation means organic heart disease ; but the folly of this was pointed out in another chapter.

Management.—Organic diseases are not curable, but their progress may be so much delayed as to prolong life many years. In the first place, all bad habits must be corrected at once and firmly. A perfectly plain and simple diet is to be used all the time, and this in moderation and with scrupulous regularity. The liver and bowels are to be kept regular, but without free catharsis ; and the kidneys must not be urged to excessive action, even when showing evidences of derangement. Physical exertion must be light, though admissible in cases of thickened walls ; while in diseased valves the most ordinary exertion gives such decided signs of increased distress that the utmost quiet is demanded. Rapid walking, going up stairs, and lifting, are especially objectionable exertions, and frequently cause feelings of apoplexy, even in cases not yet decidedly developed.

In diseased valves, their strength may be greatly sustained by the regular use of golden seal four or more times a day. This action of golden seal on the heart I discovered in 1872 ; and it is one of the most invaluable actions of that remarkable remedy. Scullcap and motherwort have a similar action ; and being also tonic to the nervous system, may be given in combination with golden seal. By thus sustaining the tone of the heart, disturbances of the liver and kidneys will best be prevented, and the occurrence of dropsy delayed or arrested.

CHAPTER LXXXV.

VARIATIONS IN THE URINE.

Most men refer every ache in the back to a wrong state of the kidneys, whereas such achings at times are muscular and occur at locations quite distinct from the kidneys. These organs are situated so high up as to be in part under the last ribs, extending an inch to an inch and a half below the ribs, and about an inch and a

half from the back-bone on either side. Sometimes they are dis eased without suffering any pain unless pressed upon, when they are found to be more or less tender. At other times they suffer pain; and this pain is not uncommonly extended downward, even to the bladder, the genital organs, or even down the inner sides of the thighs.

During twenty-four hours, a healthy adult passes from two and a half to three pints of urine. In middle life, it is seldom voided during the night; but children are frequently unable to retain their urine through the night, nervous persons are similarly troubled, and advancing years commonly reduce the power of retention and compel more or less frequent discharges through the night. Nervous and sensitive people pass an excessive amount; and any considerable nervous agitation—as fright, joy, excitement, hysteria—is nearly always followed by a decided increase in the amount of urine, which is generally very pale for some hours. One's diet has much to do with the action of the kidneys, and the large amount of meats now so commonly used proves a great burden to these organs, which have to carry out the waste from such foods and are often much overworked and finally exhausted by the unnatural and excessive amount of labor thus forced upon them.

Reduction in the quantity of urine passed occurs in all fevers; in various general diseases, as rheumatism; in diseases of other organs connected with the kidneys by the blood-vessels, as of the liver and the heart; and in some diseased conditions of the kidneys themselves. It is always desirable to restore the normal quantity, because the urine carries out in solution a variety of solid and waste materials that are quite poisonous to the system if allowed to accumulate in the blood—particularly affecting the general nervous system, and sometimes disposing to dropsy. But it is necessary to see that organs other than the kidneys are also put in healthy condition, and not to force the kidneys to tiresome action by diuretics without first taking off the burden that the other organs throw upon them. Such a course is imperative when sluggishness of the liver and derangements of digestion are original causes of scanty urine and of changes in its character. When this has been done, the kidneys themselves can be brought to a proper grade of action more easily.

It is easy to over-work the kidneys by active medicines, and there is oftentimes a great inclination to do so. Like all other organs, (p. 231) they are to be maintained in that state of action

which is nearest to the natural degree; and it is wholly improper to force them by strong articles to an excessive rate and amount of work. Generally it is best to give diuretic medicines but once in three or four hours; although such slight diuretics as spearmint and cleavers may be given once an hour. Nearly all mucilaginous and demulcent agents act more or less on the kidneys, as mallows and flaxseed; and articles that act on the nervous system frequently affect these organs, there being always a close relation between the kidneys and the nerves. It is best to give diuretic infusions cold.

Gritty or sand-like *sediment* in the urine may be caused by the beginning of gravel. It may also be caused by imperfect action of the liver, and this though the bowels move every day; for the liver may fail to carry out all the solids it should, and then they find their way through the kidneys, making the urine of a deep color and depositing a gritty reddish-brown crust that clings to the vessel. Such conditions demand slowly-acting agents for torpor of the liver, and restriction in the amount of meats eaten. When these things have been attended to, such diuretics as will be suitable for chronic congestion of the kidneys may be given.

A thick mucous sediment in the urine, which may cling tenaciously to the vessel, usually comes from inflammation or congestion of the bladder, and calls for the treatment named for that disease.

Gray or grayish-white sediment, that does not cling to the vessel but is easily disturbed when the vessel is moved, is generally due to some form of chronic congestion of the kidneys together with deranged digestion or over-eating.

Blood may appear in the urine from violence to the kidneys rupturing some of the vessels. In chronic cases, its presence may be due to gravel, to serious disease in the liver, to changes in the kidneys themselves, or to changes in the bladder. The use of rhubarb, santonin, logwood, and some other substances, will affect the color of the urine quite decidedly. Such articles of diet as water-melon, asparagus and turnips, greatly increase the amount.

CHAPTER LXXXVI.

INFLAMMATION OF THE KIDNEYS.

ACUTE inflammation of the kidneys may be brought about by exposures, injuries, the presence of gravel, as a part of scarlet fever and some other diseases, and sometimes from taking turpentine or using fly blister outwardly. It is not a common complaint.

Symptoms.—Usually there is considerable fever with headache; pain or aching in the back, and tenderness on pressure near the spine in the region of the last ribs and below; the pain many times extending down one or both groins, into the bladder and across the loins. The quantity of urine is lessened; and it is high-colored, has in some cases a grayish-yellow cloudiness (due to pus) after a few days, probably is tinged more or less deeply with blood, and when it stands deposits a grayish sediment.

When such conditions and symptoms follow an injury across the back, there is great danger of destruction of the kidneys and death in five to ten days. If mild cases occur in scarlet or typhus fever, there may be no suffering but dangerous blood-poisoning may arise, and dropsy follow in scarlatina. If gravel form in the kidney or its chamber, the symptoms may be extremely severe, as described in the chapters on gravel and renal colic. Cases due to exposure are mild in their usual course, and frequently settle into a chronic form with dull aching across the small of the back, tenderness on pressure, scanty and high-colored urine. This chronic form is often spoken of as *Congestion of the Kidney*; and is common among farmers and other out-door laborers, slowly improving and then returning, usually much aggravated in cold weather, and continuing thus for many years. It is frequently associated with congestion of the liver, which aggravates the kidney trouble; and finally favors the development of dropsy.

Treatment.—In the acute and painful forms, the patient must lie very still in bed and be well covered to promote mild perspiration; for movements increase the kidney irritation, and by increasing the action of the skin, the labor of the kidneys is relieved. Infusions of some of the mucilages should then be given, for all the mucilages pass more or less freely through the kidneys and soothe them. Any of the mallows may be used, or flaxseed; and if there are any signs of blood, a little witch-hazle or beth root or raspberry leaves should be used with the mucilage, and a few tablespoons

given every two hours. An infusion of the peach leaves, given every two hours, is excellent. For the fever, a warm infusion of white root with one-fourth part of lady slipper should be given every hour. At the same time use upon the back a compress wrung out of a strong and hot infusion of lobelia, covering it with an oiled silk or a dry towel. Water alone may be used for this, or infusion of lady slipper. The food should be mostly of gruel, toast, rice, and similar light articles, without meats.

In chronic cases, the liver must be kept in gentle yet steady action, by a suitable hepatic in small doses twice a day, as elsewhere directed for congestion of the liver. Goodly warmth of the surface must be maintained by a suitable increase of the clothing; and by regular baths of a pretty hot temperature followed by good friction. Upon the back may be used a liniment of half a drachm of oil red cedar and two drachms oil of origanum in four ounces strongest alcohol; applied twice a day. Or the Nervine Liniment may be used; and at bedtime a tepid compress may be put on and covered with a dry towel. Some persons derive much benefit from the slow and constant action of some of the resinous plasters worn upon the aching part of the back, such as Alcock's porous plaster; or one made of two parts hemlock gum, one part each olibanum and beeswax, and half a part or more of linsed oil to make it pliant when cold. These must be melted together over a gentle fire, and then spread thinly on some of the white prepared sheepskin, or upon muslin drilling.

To maintain the action of the kidneys themselves, a rather strong infusion of queen-of-meadow root with a little ginger may be taken every three hours, two or three tablespoonsful as a dose. Or an infusion may be made of equal parts queen-of-meadow, juniper berries, dwarf elder bark and spearmint; and used every three hours. Of course it is cumbersome to make infusions, but they are really better than syrups; nevertheless these same articles may be made into a syrup in the usual way, and used every three hours, but it is not well to add glycerine to any medicine used for the kidneys. Instead of using spearmint in the combination last named, when making it into a syrup, put about an even teaspoonful of gentian root to each quart of syrup.

Meats, as mentioned in the preceding chapter, must be used in great moderation; and salted fatty meats are especially objectionable.

CHAPTER LXXXVII.

STONE, GRAVEL, URINARY CALCULUS.

GRAVEL or stone-like deposits may take place in the kidneys, and from them pass to the bladder; or may accumulate originally in the bladder. Once deposited, there is a liability of their size increasing by additional accumulations; and while sandy material may be passed in the urine in a form more or less fine, the accretions within the bladder may become a stone so bulky as to measure an inch or more in diameter and weigh several ounces. Gritty particles may appear for many years in the urine without a stone forming; or a stone may form and enlarge rapidly by the aggregation of such fine particles. Stone is much more common among men than women; and is oftenest met after the fiftieth year of life, but may occur in middle life or even in children. I removed a calculus a half inch in diameter from the bladder of a child four years old. Limestone regions, where the drinking water is very "hard," most frequently develop gravel.

The formation of gravel is nearly always heralded by the deposit of a sediment in the vessel, where it forms a thin crust of a gritty character that is removed with difficulty. One class of formations is of a reddish or brick-dust appearance; and cases of this class are most numerous, are preceded and accompanied by torpor of the liver, and may continue a long time in varying degrees without forming a stone or causing suffering. Another class gives a deposit of a grayish color, rather sparkling from the angles of the grit, removed from the vessel more easily than the other, commonly accompanied with mucus in the urine and a sensitive condition of the bladder, and associated with an irritable stomach and but little torpor of liver.

A gravel of small size, as that of a grain of wheat or larger, passing from the kidney to the bladder, is likely to give attacks of severe suffering called *Renal Colic*. This suffering begins very suddenly on one side of the back and extends down the groin into the bladder and the thigh. It is often very intense, a veritable agony, with a profuse cold sweat, and often nausea and vomiting. It may continue one or several hours, causing much prostration; and during and after such an attack the water is passed in small quantities, or a few drops at a time at short intervals, and may show signs of blood or be almost pure blood. When the gravel

reaches the bladder, the agony ceases almost as suddenly as it began, leaving soreness and tenderness in the kidney and along the passage from the kidney to the bladder. Such attacks may return at quite uncertain intervals.

A stone, even of considerable size, may remain in the bladder for a long time without causing any especial disturbance of health. But it more generally gives rise to a variety of local symptoms, which are more or less decided and constant, such as dull aching in the lower portion of the back, not increased by movement or pressure; frequent passage of urine, which may contain a cloud of mucus and be tinged with blood; a sense of heat and irritation at the neck of the bladder and along the water passage, which is at times nearly constant and becomes more severe during and after the passing of urine. Among the general symptoms, those of a dyspeptic character are most common, including flatulence and heartburn after meals, belchings of wind that is usually sour, dull headache, and a tendency to muscular crampings. With such a history come in what are known as "fits of gravel,"—small stone coming away with great suffering along the water passage and blood in the urine; a large stone provoking spasms in the neck of the bladder, stoppage of urine and hours of suffering that may be really terrible and exhaustive. Such "fits" are liable to recur at wholly uncertain intervals.

Treatment.—Persons showing signs of a tendency to gravel, should take prompt and persistent measures to arrest the deposits. Moderation in the amount of food, with limitation in the quantity of meats, is an absolute necessity, to preserve digestion and prevent excess of solids in the urine. A goodly amount of water should be used, especially of pretty hot water forenoon and evening, to promote solution of solids by an increase of fluid in the urine. Rain or other soft water should be used, so as to avoid the presence of lime in hard water. Warm or tepid baths with sufficient frequency to keep the surface in good action, will be valuable; and the clothing should be regulated with the same object in cold weather. A steady and mild action of the liver must be maintained by a moderate use of wahoo with any of the milder tonics to improve digestion; and persistent scantiness of urine should be remedied by the addition of a moderate amount of juniper or dwarf elder.

In some cases, and to a limited extent, stone may be dissolved. For this purpose, ten grains of acetate of potassa in an ounce of

water may be given three times a day and once during the night. This may be continued for two or more months, provided the urine does not smell strong and ammoniacal; but in such an event, it should not be used at all.

In an attack of renal colic, keep the person still, for moving and twisting about increase the tenderness and suffering. Give a warm tea of spearmint and lady slipper very frequently, adding to each draught of it a teaspoonful of lobelia infusion to hasten relaxation of the passage from the kidney to the bladder. Give by injection, and have retained in the bowel, an even teaspoonful of lobelia and twice as much lady slipper in two or three ounces of thin starch water, and repeat in an hour. Flannels wrung out of hot infusion of lobelia should be laid over the painful parts, and renewed as often as they get cool; or use a broad poultice of lobelia and flaxseed; and cover the person well in a warm room if the weather is cool. It demands much perseverance in this course. After an attack, flaxseed, peach leaves, or other demulcent infusion should be used freely several times a day, so long as tenderness continues; and queen-of-meadow or spearmint added to increase the flow of urine. If there is any blood in the urine, as there is likely to be, some witch-hazle should be given four times a day, either in syrup or in connection with the demulcent drink.

When stone in the bladder causes a fit of suffering, use an injection of lady slipper and lobelia as above directed for renal colic; and give an infusion of spearmint or catnip or balm, with a very little lobelia, a small dose every ten or twenty minutes, so as to induce relaxation without too much nausea. The frequency of such attacks can usually be lessened by pursuing the course directed in another chapter for inflammation of the bladder.

CHAPTER LXXXVIII.

INFLAMMATION OF THE BLADDER.

IN the *acute* form, inflammation of the bladder may be caused by violence over the organ, the presence of gravel or other foreign solids, and the presence of retained urine. Sometimes it results from colds, and from the use of turpentine or Spanish-fly blister (cantharides) inwardly or outwardly.

Attacks of this disease are intensely severe, coming on suddenly and causing great suffering. The desire to void urine is frequent, recurring every hour or much less; it must be responded to immediately, even a few minutes of retention being impossible in most instances; and its passage is accompanied by burning and smarting sensations in the passage, aching across the share bones, and general suffering of a depressing nature. Usually there is feverishness, the amount of which corresponds to the amount of local inflammation. In many persons there are repeated attacks of slight shivering, occurring mostly when the lining membrane of the bladder is so damaged as to form pus, or when the suffering causes a species of shock to the nervous system. The urine is more or less cloudy, and may give a mucous deposit that clings to the vessel. Some attacks last but a few hours; others last many days, and may finally end in the chronic form.

Treatment.—In acute attacks, the sufferer must lie down and keep as still as possible. Hot hip-bathes are valuable, large and hot poultices of flaxseed over the pubes following them. Demulcent drinks should be used freely, as of flaxseed, water-melon seed, or thin barley water—one-third of a teacupful or more every hour or two hours. A mild physic should be given, as a Seidlitz powder or Rochelle salts. As considerable nervous disturbance may accompany or follow the suffering, a tablespoonful or two of a strong infusion of two parts lady slipper and one part queen-of-meadow should be given every two or three hours, and continued for some days or until the suffering has been fully removed. The diet should be plain and light. As relapses occur on slight provocation, it is necessary to be prudent and watchful for many weeks; and hard labor, lifting, exposure to cold, and a hearty diet avoided.

Chronic inflammation is liable to be developed by a repetition of acute attacks, or to follow a single acute attack when the person is indiscreet in exposure or habits. It may also arise from the presence of gravel, a habit of retaining the urine too long, or retention caused by paralysis or other disease, or from an altered and a highly acrid state of the urine itself. The symptoms vary much in the degree of their severity, but are mostly a too great frequency of urination, more or less aching across the pubic or share bones, distress in the bladder almost constantly, and a cloudy appearance of the urine. It is painful to attempt to retain the urine for even a short time; sometimes the aching across the lower abdomen is sharp, and is always wearying; there is commonly an

inability to empty the bladder thoroughly, even by distressful straining, and in most cases there are heavy deposits of glairy mucus in the water. In severe cases the sufferer is depressed and wretched all the time, often chilly, and unable to do any work—hard-working people being most liable to it after middle life. Elderly people are much weakened in this disease, large quantities of mucus and some pus in the urine is nearly constant with them, and there is a general distress and falling-off of strength and flesh.

Treatment.—An excellent article for these cases is an infusion of the couch-grass or quack-grass, four ounces of the root being boiled in a quart of water to a pint, and this quantity used in the course of twenty-four hours. The leaves of the peach-tree may be used for the same purpose, adding one-fourth part of the queen-of-meadow, steeping in hot water and making fresh each morning. In old cases, a few grains of buchu leaves may be added to either of these infusions, or ten to twelve drops of the fluid extract of buchu given once in three hours. The leaves of uva ursi are excellent with couch-grass in old cases. When the irritability is great and the deposits of mucus considerable, it is well to add the use of five or ten grains of cooking soda three times a day. Warm hip-baths and general baths must be used at moderate intervals, and the surface well protected from chilliness in cold weather. Heavy labor is simply impossible. Diet of a plain and succulent character is advisable, including asparagus, turnips, barley and similar foods; while meats, acid fruits, sugar and coffee are to be greatly restricted. If the bladder can not be emptied, the catheter must be used regularly.

CHAPTER LXXXIX.

RETENTION OF URINE.

RETENTION means an inability to pass the urine from the bladder, in consequence of which the bladder gets full to over-distension and causes terrible suffering after a time. In prolonged cases of retention the sufferer may have a cold sweat amid his agony, and this perspiration may have the odor of urine. Sometimes the bladder has burst in retention, but this is exceedingly rare. It is

important not to confound *retention* with *suppression*. Urine is suppressed when the kidneys fail to secrete it, and in consequence the bladder is nearly empty. In *retention*, the distended bladder can, after a time, be felt as a rounded swelling rising above the pubic bones, but no such swelling can be found in suppression. If the kidneys should be excited to increased activity in retention, the bladder would be filled the more rapidly, and the suffering and danger be gravely increased. Suppression is spoken of in another place.

Treatment.—Quite warm applications over the pubes and about the genitals—as of flannels wrung from hot water, or flaxseed poultices—are to be employed promptly, and may soon overcome an ordinary stoppage. A hot sitz bath is excellent. A quick purge, as a large dose of Rochelle salts or a Seidlitz powder, often aids the expulsion of urine in sudden retention. But time must not be wasted, and a catheter must be used early if relief is not obtained soon. A moderate or small-sized instrument must be employed, and its introduction be made gently and cautiously. Spasm of the urethra sometimes causes retention, and in general is soon overcome by these measures; but stricture causes more severe trouble, and has to be managed with great persistence in using the catheter gradually to dilate the passage.

CHAPTER XC.

SUPPRESSION OF URINE.

SUPPRESSION of urine means a failure of the kidneys to secrete the water, or a failure to pass from the kidneys to the bladder because of gravel in the passages, or of a tumor pressing on the passages. It differs greatly from *retention*, as spoken of in another chapter. Suppression from disease or injury to the kidneys, usually offers a limited amount of secretion, steadily diminishing until all flow ceases. From a gravel, the stoppage is from one kidney, and gives attacks of the terrible suffering called Renal Colic, described in another chapter. From growths or tumors in the passage itself, or in neighboring parts causing obstruction by pressure, the flow diminishes gradually till finally suppressed altogether.

When suppression is absolute in these latter cases, seven or eight days may pass before the patient appears to suffer materially; but then there come on muscular twitchings, muscular weakness, contraction of the pupils, drowsiness, and sometimes convulsions. Life under such circumstances endures from nine to eleven days. Suppression may occur in the cold stage of cholera.

Treatment.—Under all circumstances suppression of the urine is an extremely dangerous condition,—indicating a degree of kidney disease that is not likely to be improved, or a pressure that cannot be overcome. But some cases are remedied. It is important that strong diuretic medicines should never be given, although the temptation to use them is very great. Hot baths and hot fomentations over the kidneys and along the line of suffering in the groins, are the most valuable measures. A warm room and great quietude must be enjoined. In some cases of obstruction, careful—very careful—kneading of the abdomen, persevered in, has removed the obstacle and secured relief.

CHAPTER XCI.

INCONTINENCE OF URINE.—ENURESIS.

By incontinence is meant an inability of the bladder to retain the urine, which then passes away involuntarily, especially during sleep. It is essentially a trouble of childhood; but may continue to puberty, or even later, in exceptional cases. Boys are troubled more frequently than girls. During the day, the child passes urine more frequently than is common to other children. At night, during sound sleep, the bladder empties itself unconsciously one or several times,—much to the discomfort and mortification of the child.

In probably all cases of this kind, the child is of a delicate organization, slender and highly nervous. As physical development advances the strength of the system increases, and so this annoying incontinence is gradually overcome by the growing power of the muscles of the bladder. It is when the nervous sensitiveness of the body remains too exalted, and the general tone improves very slowly, that the incontinence continues for

years. Parents should keep in mind these simple facts, when a child is thus troubled with inability to hold the water during the night, and steadily pursue a course that will moderate nervous irritability and develop muscular vigor. In too many instances the parents scold and punish the child. This is the very height of cruelty, and positively increases the difficulty by adding to the nervous excitement. A child in a deep sleep knows nothing of the accident that happens to it; and when it awakes, the mortification felt is a punishment of the keenest nature to the over-sensitive mind. For a parent to withdraw sympathy from this child, or to reproach or punish it, is to disturb the nerve centers so much the more, to weaken and derange them, and thus to make the liability to prolonged incontinence all the greater. The child can no more control its weakness during sleep, than the parent could carry on a conversation or perform music or do any other act of intelligence during sleep. Consciousness and will are not then in action; and to scold or whip a child when awake for not doing what it is totally impossible for it to do when asleep, is cruelty of a thoughtless but most damaging type to the helpless child. I have seen so much injustice done to such children, and so much misery thrust upon them by their mistaken parents, that I cannot be too earnest in trying to shield little sufferers from such unmerited punishments.

Treatment.—In all suitable ways endeavor to bring up the general vigor of these children, as by an out-door life so far as possible, plain and easily digested diet, avoidance of pastry and sweets, and good protection of the surface against chilliness in cold weather. Reading and studying must be moderated, and unusually pale and sensitive children must be taken from school for a season or two. Play must also be moderated, for the child may quite exhaust the system day by day in over-doing his healthful pastimes. Running is perhaps the most wearisome of plays, and it is important to limit these enjoyments in the latter part of the day, so that the child may not go to bed with the body fatigued. Some restriction in the use of fluids in the evening is advisable; but to deny an active and growing child all drink is cruel, besides causing a restless dissatisfaction of the nervous system that increases the liability to incontinence during the night.

On the part of the parent, there should be continuous watchfulness to have the child empty the bladder at stated intervals of the night. The times chosen should be regular, and persisted in

quite regularly, so as to promote a habit of micturition in the child himself. The last thing at the parent's own bedtime, and then twice more during the night, are usually enough. It may be almost or quite impossible to get the child awake, a fact that should prove to any parent how incapable the little one is of waking and rising to the vessel by himself; but if lifted and placed on the vessel, and encouraged by a few *kind* words (never startled by scolding), the child will soon empty the bladder. If the parent cannot wake at regular times, a cheap alarm clock will help to regulate him.

Medication is generally of small consequence, except as it aids digestion and keeps the bowels regular when necessary. Many of these children are aided in toning up the nervous system by using small doses of the Compound Syrup Mitchella four times a day. A rather strong infusion of agrimony used during the day and evening often proves quite strengthening to the bladder, and may effect a cure.

Elderly persons, especially men, are at times troubled with what seems to be incontinence of urine. The water dribbles away almost continuously; or suddenly passes in small gushes which they cannot restrain, and of which they may be unconscious. In reality this is not incontinence so much as it is an overflow from a distended bladder, due to a partial paralysis. In such cases, the bladder must be emptied very regularly with a catheter.

Sometimes women cannot retain their urine for an instant if suddenly startled. They are highly sensitive, and usually do well on the Mitchella Syrup.

CHAPTER XCII.

HEADACHE.

HEADACHE is one of the most common troubles of humanity. It occurs in the widest degrees of severity, from a simple dull inconvenience to acute distress,—lasting but a few hours or through a day or more, occurring at distant intervals or with very burdensome frequency. It may be caused directly by conditions in the head; but in most instances is more or less sympathetic with conditions elsewhere, or with a general state of the system. As it

will require differences of treatment according to its cause, the more common forms of head suffering may be named separately.

I. *Bilious Headache*.—In this the pain is mostly across the forehead, back of the eyes, and along the temples. It is generally dull in character, occasionally most severe and throbbing, often is preceded by some dizziness, and in some instances is increased by noise and motion. Many times a rather voracious appetite is enjoyed for a day or two before a sudden attack; but is at once lost with the onset of the suffering, and remains poor for two or three days after. The tongue is coated, digestion is interrupted, constipation is almost invariably present, fermenting food in the stomach may cause feverishness but otherwise the person may feel cool or even chilly. In such attacks, the vessels of the brain are distended with blood, and the head is hot; and they generally leave a sense of soreness within the frontal portion of the cranium. This is essentially the headache of a torpid liver and indigestion.

Chronic cases of this form of headache occur frequently. In them the suffering is of dull and heavy character; and usually persists for weeks and months with but limited spells of abatement. Bile is insufficiently removed, and accumulates in the blood—floating throughout the system and poisoning it everywhere. Such cases come under the head of Congestion of the Liver, to which the headache is a marked symptom. In malarial districts, chronic malarial poisoning in varying degrees is added to the liver torpor, and makes the headache more continuous and unabating. In some constitutions, these prolonged bilious headaches are connected not only with jaundice, but with very obstinate hypochondria,—the bile poisoning, and the liver and spleen derangements, warping the clearness of the mental action. Persons of a bilious temperament get very morose, and have those peculiar feelings of despondency known as a “fit of the blues,” whenever they have an attack of bilious headache. The hypochondriacal form of insanity is usually preceded for weeks or months by these conditions of the head and liver; and such cases are much less mental than liver troubles, and are generally ended by a prompt yet discreet re-establishment of the tone and functions of the liver, gall-ducts and bowels.

The treatment of these bilious headaches, in sudden cases, calls for a distinct reduction in the diet, abstinence from coffee, quietude, and then a prompt evacuation of the liver and bowels. For this purpose, one may use the Leptandrin Pills, or a powder

of two grains leptandrin and one grain euonymin. Full-blooded people do well to take a dose of Rochelle salts and rhubarb so as act during the day; and follow at bed-time for a few nights with one leptandrin pill. Hot foot baths, by relieving the pressure of blood toward the brain, often assist in bringing relief; and occasionally applications to the head of cold wet cloths, or cloths wet in vinegar and water, are grateful. If food is fermenting in the stomach, a goodly dose of soda will be needed and may be repeated in smaller portions in three or four hours; but sometimes no fair relief can be secured from the suffering and fever without dislodging the offending food with a quick emetic.

In chronic cases, and when acute attacks return so frequently as scarcely to leave a period of good health between them, it will be necessary to sustain a good state of the stomach and liver by the steady daily use of those remedies which are elsewhere advised for chronic torpor of the liver. Some of these cases mingle a large share of nervousness with the bilious condition; and will require a portion of scullcap or lady slipper for the nerves, in connection with wahoo or other liver tonic. A very determined and persistent course of such treatment is demanded, together with a thoroughly plain diet, and probably a distinct change of residence when the case is disposed to settle into hypochondria.

II. *Nervous Headache*.—Usually this is limited to one side of the head, thence called *hemicrania*. Suffering is acute, chiefly in the region of the eye-brow and at its outer corner; from which it may extend into the eyeball, along the temple, etc. It often begins in the morning and lasts till night,—the suffering sometimes being moderate and not materially interfering with the duties of one's life, but at other times becoming extremely severe and preventing the least exertion or motion. Persons of nervous temperament, and those leading a life of mental labor, are most liable to this form of headache; and women often suffer from it with periodical regularity. In malarial districts it is quite inclined to return with a certain exactness, the attacks often alternating from one side to the other. In some persons it terminates quite uniformly in an attack of the "Sick Headache," which is considered elsewhere. It is generally associated with feeble digestion, and with a tendency to neuralgic conditions; but may exist quite independently of liver troubles, though many times connected with them. A curious instance of this form of nervous suffering is what is sometimes called "*Hungry Headache*," arising with some persons

when a meal has been delayed or the system otherwise denied a full amount of food. It may become quite severe, especially in those of nervous-sanguine temperament and accustomed to brain work. A full meal soon relieves it by diverting the heavy flow of blood from the head to the stomach.

An attack of nervous headache demands thorough quiet and rest, freedom from noise and conversation, and a darkened room. It has become a custom to laugh at women who are subject to this form of suffering, especially when it arises from a general sensitiveness of the nervous system in company with a distressing tendency to hysteria. This is a piece of unfeeling cruelty; for nervous headache is, while it lasts, an agonizing thing, and hysteria is a mark of a disturbed generative and nervous system that should always receive proper sympathy. (See my WOMAN'S BOOK OF HEALTH.)

These sufferers generally, but not always, like the temples and forehead laved repeatedly with rather warm water, or with cologne water, sometimes with a very little spirits of camphor, or with vinegar containing spices and diluted with tepid water,—the fragrance of these things being also at times quite acceptable. Some persons like a handkerchief bound pretty tightly about the head, but others object to this.

During the attack, a strong infusion of two parts lady slipper and one part dioscorea may be given in moderate quantities once an hour or two hours. Or a powder of the concentrated preparations of these may be given every two hours, as two grains of cypripedin and one grain of dioscorein with half a grain of scutellarin. In malarial districts I have used a powder of two grains salicin, and one grain each scutellarin and caulophyllin, every two or three hours. If the stomach is sour, give four or five grains of soda, and repeat in an hour if necessary. Food is usually refused; but if an attack continues for several hours, a small quantity of light food and a little pretty hot tea should be urged on the patient, and usually will then bring relief. As the attack is breaking up, the bowels must be moved gently. Persons who are persistently afflicted with attacks of this kind, need to pursue a course that will invigorate the system, as in Neuralgia.

Headache is a frequent symptom in anaemia, as described in the chapter on that malady. In many female diseases it is likely to be present across the top of the head; and frequently so in fissure of the rectum. At the back of the head and extending

down the neck somewhat, it may proceed from a slow blood poisoning incident to diseases of the kidneys. Rheumatic headache is accompanied by feelings of stiffness in the scalp and along the muscles of the neck, which sufficiently distinguish it from other such pains. All fevers give more or less headache, mostly in the frontal region; and sometimes this is exceedingly severe, as in cerebro-spinal fever, typhus fever, and small-pox. In all these cases of sympathetic head suffering, the treatment is directed to the ruling malady and not to the head.

Causes for intense headache arise within the cranium itself. Among these are the gradual advances of inflammation of the brain; softening of the brain, with deep suffering nearly constant at one spot; tumors of the brain, with some general disturbances, unaccountable loss of strength, and probably vomiting.

CHAPTER XCIII.

WAKEFULNESS. INSOMNIA.

PERSONS differ to some extent in the amount of sleep they require (p. 187), but any material diminution of a general average may be fraught with damage to the nervous system, when prolonged. During middle and advancing life, such losses may occur with much persistency, persons not being able to secure that amount of sound rest which is necessary for the due recuperation of the body. Yet persons *can* live and thrive on a marvelously small amount of sleep.

These disturbances are exceedingly varied in form. Many sleep in their chair or on a lounge in the early part of the evening, get thoroughly aroused on going to bed, and then lie awake for hours, and possibly till early morning, when they may again obtain some sleep. Others get no sleep whatever till midnight or much later. Others sleep for an hour or two after retiring, then awake and get little or no sleep for the remainder of the night. Some may pass night after night without sleep; but this can endure but for a short time, as its continuance would soon end in insanity. It is altogether probable that this latter class of people get some sleep each night without being conscious of the fact; for there is a form of sleep, and an exceedingly recuperative one,

in which the mind is wholly unaware of the fact that any rest whatever has been enjoyed. Persons who are subject to insomnia presently become morbid on the matter, and dwell upon it with a species of hypochondriacal exaggeration that is unpleasant. It would be of much benefit to them if they could cease thinking about the little disturbance in their habit.

The causes that lead to undue wakefulness are many. Anxieties in business, cares and sorrows in the home life, exhausted and over-excited conditions of the mind and nervous system, are among its most common causes; and as such influences are likely to act through considerable periods, the wakeful habit once set up is liable to continue for some time. In most instances the disturbance started in some such cause; and then it is readily helped on by too hearty eating in the evening, indigestion, suffering, etc.

In managing abnormal wakefulness, the whole frame must be brought as near the natural condition as possible. Let the bowels be regulated, if need be; also the liver and stomach, taking every precaution to prevent indigestion and to remedy it if already present. The nervous system itself then needs to be put in good condition; but no person who values good health should ever resort to opium, morphine, chloral, or any sedative or narcotic whatever. These can never do more than bring a false and unnatural form of rest, which is not satisfying to the body. They carry the nerves and the brain farther and farther away from the conditions of health, and presently fasten upon the body a diseased state of the nerves which is most undesirable and perhaps is incurable. They then have to be used in larger and yet larger doses, wrecking both mind and body. Thousands and thousands of times they have cut off life suddenly and unexpectedly. And when all these risks and dangers have been passed through, the wakefulness is never *cured* by such articles, but is nearly always relieved and cured readily by means that are perfectly harmless.

Lady slipper is a very serviceable agent in soothing the nervous system, and relieving the pressure of blood upon the brain that generally exists under these circumstances. A rather strong infusion may be made, or three grains of the preparation cypripedin may be used every two hours during the evening. Many times a small portion of scullcap to the infusion, or of scutellarin to the powder, is of great advantage. Valerian has a well deserved reputation for these purposes, but its peculiar taste and smell are often objectionable. I have always done best with

valerian when using but a little of it with a nervine tonic, thus: Half an ounce fluid extract scullcap, one ounce fluid extract lady slipper, two drachms each fluid extract valerian and tincture prickly ash, and two ounces syrup. A few drops essence of anise is good to disguise the valerian. Half to a whole teaspoonful of this may be used every two hours, beginning an hour or more after an early and light supper.

A rather hot foot bath has a good influence in diverting the flow of blood from the brain, and is often of much service. Some persons with good digestion do well by eating a bowl of hot milk and bread before retiring,—the demand for blood in the stomach to carry on digestion often relieving the head. A heaping teaspoonful of lady slipper in two ounces of starch water, taken as an injection at bedtime and retained, is quite effective with many,—soothing the nerves and dilating the blood vessels of the abdomen. When the head is hot, a light compress wrung from cold water and laid across the forehead, especially between the eyes, is of much service.

These persons must firmly lay aside business cares and all study during the evening hours. It is quite natural for families to discuss their trials and anxieties when together in the evening; but the mere broaching of such themes is quite sure to cost the wakeful one another sleepless night. All such topics of conversation, and everything leaning toward such topics, should be put aside determinedly; and so should the student put aside his lessons, the literary man his themes, etc. Instead of these things, the mind should be diverted with lively conversation, music, agreeable company, and similar means of pleasure at home. It is no uncommon thing for these wakeful ones to go to sleep in their chair soon after the evening meal, taking no part whatever in the chat of the family, and thus insuring sleeplessness during the customary sleeping hours. Such a course is the very opposite of the right one. They would better always take a short but somewhat brisk walk after the meal; and then join the family and help make the evening lively, or arrange to have a couple of friends call and spend part of the evening in pleasantry, or go with the wife to make a short and informal call on some friend. A social course of this kind, wholly preventing any naps before bedtime, is of untold service in relieving the brain from tension and in putting body and mind in condition that will be favorable to sleep.

The hour chosen for retiring should be dictated by the needs of each person. Usually it is a loss to retire too early, which commonly assures lying awake so long that restlessness begins before the due hour for sleeping arrives. On the other hand, sitting up too late with the intention of fatiguing the body, may induce excitement with such fatigue, and these conditions are not reasonably favorable to sleep.

On lying down, the person should by his will let every muscle and nerve in the body fall into relaxation. A little practice will enable any person to do this, and thereby relieve the frame from that state of tension which always extends to the mind and puts it in a wide-awake condition. Bodily stiffness and restlessness cannot fail to impress the mind and keep it in a condition that will interfere with early sleep. In like manner, here as always, the state of the mind reacts upon the body; and it is imperative that business and thought be put away from the mind on going to bed. The very thought of trying to get to sleep should be banished from the brain.

It is a common practice to try and coax sleep by fixing the mind upon some monotonous occupation,—such as counting numbers, counting imaginary sheep or rats, etc.,—and continuing this till sheer exhaustion compels the brain to rest. One thought will displace another in the mind; and it is measurably true that such mental tasks will turn the faculties away from business, study, anxiety, etc. But they are merely tasks of another kind; they keep up continuous mental action; and mental activity does not give a natural drift toward sleep, and mental exhaustion is decidedly a very poor pabulum to go to sleep upon. Such methods, therefore, are unnatural and unphysiological, and rarely succeed.

A much simpler, more normal, truly physiological and far more effective plan, is to *stop thinking altogether!* This may seem to be impossible; but it is entirely possible and under the direction of the will power. Allow no thought whatever to seize upon the attention. As one is put aside, two or a dozen others may spring up to take its place. Lay them aside also, and do not allow one of them to take shape or assume form. Do not even think of sleep, or that you are putting away thoughts for the purpose of trying to get sleep. That would be imitating the Irishman who shut his eyes and then looked in the glass, that he might see how he looked when he was asleep. Refuse a lodging place

in the mind to any thought whatever, let the body drop into the utmost laxness as already advised, and there will be verified the Hibernian chestnut,—“the first thing you know you will not know anything.” I have proven this in my own person, when the anxieties of my profession would keep me awake night after night till clear professional judgment became impossible. I have taught the plan to hundreds of people; and they soon learned it and became good sleepers.

CHAPTER XCIV.

SICK HEADACHE. NERVOUS HEADACHE. MEGRIM.

SICK headache is periodical with some persons, especially ladies at each monthly change; but may occur once or oftener each week, once in two or three months, or without any regularity whatever. Women are more subject to it than men, it oftenest attacks those of nervous or nervous-bilious temperament, and very frequently is hereditary in families. Attacks may be provoked by either mental or bodily fatigue, excitement, grief, social excesses, improper food, exposure to the sun, an impure atmosphere and other depressing influences. It is in a measure allied to bilious vomiting, as elsewhere described; but shows much less bilious derangements, sometimes none at all, while the nervous disturbances are very pronounced. Anæmic or thin-blooded and impoverished people are quite liable to it.

Symptoms.—Attacks commonly begin early in the morning, increase in severity through several hours, slowly decline toward evening, and disappear during the night; but light cases may last but a few hours at most. With most persons, the onset is a peculiar disturbance of vision,—as a dark spot that is wavy and soon spreads; or a wavy glimmer to one side, spreading, often with dark and colored zig-zag lines mingled. At the same time there may be chilliness, and coldness of the hands and feet. If the sight is not disturbed, the chilliness and coldness will be the more decided. From fifteen to thirty minutes are occupied with these premonitory symptoms.

Headache follows, usually beginning at a spot in one temple and slowly spreading over the whole of that side of the head, and

perhaps then to the other side. The suffering increases gradually, the eye-balls (oftenest the left one) ache and are tender, the head throbs and is hot, the mouth is clammy, the face is pale, nausea follows and is increased by the slightest movement, by and by vomiting occurs but seldom gives any relief. The patient lies as one half dead, and is prostrated with helpless misery for the day. On the following morning he will probably be free from headache, but be listless, pale, and weary. Occasionally the headache is trifling and of brief duration; sometimes there is little nausea and no vomiting; but these are exceptional cases.

Treatment.—Persons afflicted with this distressing malady generally conclude that it is useless to attempt to obtain relief, having been taught by most physicians that medication can do no good. But the attacks can be made lighter, shorter, and much farther apart by judicious management.

Between the attacks, carefully treat any condition that may provoke them. Avoid overwork, fatigue, mental strain, prolonged anxiety; and so far as possible cure female derangements, liver disturbances, poor digestion, habitual constipation, impoverishment of the blood, and nervous debility, as elsewhere directed. Refrain from excesses in eating; and especially *abstain totally* from the use of coffee, which no subject of sick-headache should touch if he wants to recover. The Nervine Tonic is a suitable article to use daily; and to the mixture named elsewhere may be added half an ounce of scullcap. Take the Liver Pills or Butternut Syrup occasionally, to keep the liver and bowels in good action.

Feeble persons should lie in bed longer than most people, say not less than twelve hours out of the twenty-four. And they should have some nourishment an hour or two before they leave the bed in the morning, regardless of what other people may think or say. I have been in the habit of directing such people to take two or three grains of salicin and half a grain of caulophyllin as soon as they awake, and in fifteen minutes a small glass of milk, or part of a cup of warm chicken or mutton broth, well seasoned. In two hours repeat the medicine, and then partake of a light breakfast, rising an hour or more after this. When the patient is weak and rather bloodless and the attacks come rather close together, this course is imperative for a long time. And all these patients should avoid dark rooms and live out-of-doors as much as possible.

At the first signs of an approaching attack, the patient should

lie down with the head quite low. If the glimmering light appear to one side, then lie on the *opposite* side. Take at once an infusion of four parts ginger, one part dioscorea, one-fourth part Virginia snake-root, and enough red pepper to make it taste rather sharply. Give it warm, two teaspoonfuls at a time every ten minutes till the coldness has passed away; then a teaspoonful every half hour. Put hot jugs or other articles at the feet, and insist on the utmost stillness. Many an attack have I averted in this way, shortened them always, and in numerous instances made a full cure by following this course.

During the period of sharp headache, little can be done beyond maintaining the utmost quiet. Keep the feet warm, using a stimulating foot-bath if necessary. Apply to the temples and forehead cloths dipped in pretty warm water, and renew at intervals. Some like to smell camphor or hartshorn (ammonia), but let them suit themselves about this. Don't talk to the patient, don't offer food, don't attempt to check the nausea or vomiting by soda or Cordial or any other alkali—which only increases the vomiting. Sometimes I have put ten grains soda hyposulphite in four ounces moderately strong camomile tea and a few drops essence of peppermint, and given a teaspoonful every fifteen minutes the first two hours, and then every thirty minutes. So excellent has been the result of this simple plan, that it seems to be almost like a specific for the attacks. When the attacks come on suddenly, the severe headache being the first symptom, a teaspoonful of elixir of guarana may be given every hour for three doses, with the soda hyposulphite preparation between them.

CHAPTER XCV.

SUNSTROKE. HEATSTROKE.

DURING the high heats of summer, many suffer from the effect of the long-continued elevation of temperature. Some die quite suddenly; others die after ten to twenty-four hours; a large majority recover, suffering weakness and many discomforts during the remainder of the summer, probably suffering more or less every summer for ten or twenty years afterwards. The direct rays of the sun cause most cases; and these are often intensified

by the heat reflected from pavements and walls in cities, whence cities furnish more cases than the country. But it may be caused by high and protracted heat in places where the sun is not shining, as in factories, hospitals, in front of furnaces, in close and small rooms, in a heated kitchen, etc. Sometimes, in cities, it comes on during the night when the wind dies down and the heated air is close and stifling.

Whatever weakens the nervous system and wearies the circulation, favors sunstroke. The malady is essentially one of nerve exhaustion from the brain outward; and of such heart exhaustion as inclines to feeble circulation, and to congestion in the brain, lungs, and elsewhere. The great majority of cases occur among those who indulge in malt and spirituous liquors. In a season of unusual heat, nearly all the cases are in this class, and very few of them recover; while strictly sober people suffer in but small numbers, and these are generally saved. Prolonged labor, fatigues of any kind, mental worry and strain, previous ill health, over-crowded and impure quarters, and the excessive use of iced water, all are directly favorable to attacks of sunstroke. Places and seasons which add moistness to the high temperature, are more promotive of sunstroke than when the atmosphere is dry and free perspiration is maintained.

Symptoms.—Simple cases occur with swimming sensations in the head, apparent circling motion of surrounding objects, partial or complete fainting, pale and cold surface covered with moisture, a very quick and feeble pulse. For a time the patient is fully conscious of the accession of these feelings, and some remain conscious throughout. Such cases are not often fatal. The heart is not heard nor the breathing labored or snoring.

More distinct and severe cases occur during direct sun exposure, particularly of the head and neck. Premonitory symptoms are few, yet the patient may be warned by peculiar feelings of weakness and depression, and might save himself if he would heed the warning and seek the shade. Suddenly the patient loses consciousness and falls. The face is dusky red, the head is very hot, the blood-vessels on the temples and forehead are swollen, the breathing is heavy and snoring, the pulse may be full and slow for a time but soon shows evidence of failure. In from a few minutes to an hour or more, signs of sinking are manifest, such as cold extremities, small and feeble pulse, slow and struggling breathing. Recovery may take place if improvement is noticed

in a short time; but danger increases as time passes without improvement, and death is imminent. The internal heat of these cases may rise to 108° or 110° F.

A number of cases come on slowly, and in the shade or during the night quite as well as during the day and in the sunshine. There are fever, thirst, great restlessness, hurried and gasping breath, frequent passages of urine, pungent heat upon the skin, labored and jerking pulse, and a livid appearance to the face and neck. The internal heat shown by the thermometer is very great. Gradually the patient begins to fail, the urine ceases, delirium and probably convulsions set in, stupor and dilated pupils are common. Partial recovery may take place; to be followed by suddenly fatal relapse, or by brain troubles that are slow and exceedingly uncertain. Cases of this class are most frequent in persons exhausted by fatigue, overcrowding, illness, dissipation, or other cause of nerve depression. Attacks are generally preceded for some hours, or days, by feelings of giddiness, headache, general discomfort, derangements of the bowels, frequent and large passages of urine, restlessness, wakefulness, hurried and shallow breathing, possibly nausea or vomiting, and other signs of great nervous disturbance.

Treatment.—Remove the patient to a shaded and cool place quickly; remove all tight and surplus clothing; keep back the bystanders, that he may have all the air possible. It is the usual plan to apply ice or iced-water to the head, chest and trunk; and even to lay the head in a basin of cracked ice, and to put the same upon the chest. I protest against such methods as in themselves capable of presently chilling a well man so thoroughly as to endanger his life, which the exercise of a little common-sense will tell any one; while in the exhausted state of such a patient, with brain and lungs passing into congestion and the heart so depressed that it can hardly keep up its action, these severely cold appliances must depress the life centers more. Outward cold is well known to force the blood in upon the heart and lungs, and to overwhelm them. In sunstroke, these organs are already failing along with the nervous system; and have no power to re-act against the current of blood that must be driven in upon them by iced applications upon the surface. Proof of their damaging effects is found in the enormous percentage of deaths when this plan is followed. It is not so much a physical cooling of the blood that is demanded (which iced measures will certainly do, and soon carry the heat dangerously below the natural degree); but a support of the

nervous system and heart, and a relief of the central vessels from overcrowding of blood.

Lave the head with warm water, and also the chest and trunk, moving the patient as little as possible. Water at this temperature fills the outer vessels and draws the blood away from the lungs and heart; it also starts perspiration, which is Nature's own mode of cooling the blood to the proper degree. Use the water liberally and constantly. Bathe the extremities with warm water containing ginger, red pepper, or mustard, that the surface here may be well stimulated; and repeat every few minutes while the parts remain cool. Use similar stimulation along the lower two-thirds of the spine every half hour while there is any lethargy. A cloth wrung from a warm infusion of red pepper should be placed at the nape of the neck, and another upon the pit of the stomach.

Unload the bowels soon with a large injection of lukewarm water containing a teaspoonful of powdered ginger. If this fail to act in half an hour or less, repeat it and add a couple of grains of red pepper. Every hour give a small injection of lukewarm water with a teaspoonful of lady slipper and half a teaspoonful of ginger, and keep these in by a compress. Such injections are of great value. Little can be given by the mouth; but a teaspoonful every five or ten minutes may be given cautiously, using for this purpose an infusion of four parts ginger, one part golden seal, and enough red pepper to make it taste rather sharp. It is common to resort to whisky, brandy, or some such unnatural stimulant; but the infusion I have named is a thousand times more powerful in sustaining the heart and blood-vessels naturally, and does not interfere with the well-being of the frame as all forms of spirituous stimulants will.

These measures must be persevered in vigorously, without side experiments with liquors, quinine, bromides, and other articles totally out of place. I can say, as the result of this method, that death is far from being the rule, as it will save the great majority of cases,—probably 95 out of 100 severe cases.

For protection against the sun, wear in the hat a wet handkerchief or a piece of muslin; and a cape of white muslin falling loosely from the rear brim of the hat well down upon the sides and back of the neck. Only a thin and porous hat should be worn. Total abstinence from malt and spirituous drinks, must be the rule of all who value their safety. Iced drinks must be used

in great moderation, and abstained from entirely if they are found to impair digestion; and at no time should they be used at a very low temperature. Farmers, laborers, and others similarly exposed, will find the best drink to be milk containing one-tenth of an even teaspoonful of red pepper to the quart. This sustains the heart, prevents too great difference between the outer and inner circulation, and is a truly sovereign mode of preventing sun trouble. The pepper may be used in water, and good ginger may be substituted for pepper.

CHAPTER XCVI.

NEURALGIA.

By this term is meant acute suffering occurring in paroxysms, and not due to inflammation. Such suffering is usually limited to one nerve and its branches, as on one side of the face (*tic douloureux*); the great nerve of the thigh from the buttock to the foot (*sciatica*); the nerves supplying the muscles between the ribs; the bowels (*colic*), womb, heart and other viscera.

Neuralgic pains are not continuous, as is the pain of inflammation and other diseased conditions. It is more or less strongly intermittent, returning in paroxysms without perhaps any apparent cause; and then ceasing altogether, or lingering in a dull form till another dash of agony shoots along the nerve. Such paroxysms may recur at short intervals, and continue to do so for hours or days; and then discontinue without apparent cause, returning without system or warning. Some spots in the nerve are tender on pressure; but they are limited, and show no marks of disease other than the suffering.

Neuralgic sufferings are prone to develop in some families, and under certain circumstances are readily developed. Persons of a nervous and excitable organization, and of an irritable disposition, are most liable to neuralgic displays. It is rare before puberty, but may develop soon after that period. Influences that weary, over-burden and slowly reduce the system, favor its accession; and it might well be said that neuralgia is not probable till the general nutrition and strength of the system have been lowered. Thus anæmia and other forms of diminished nutrition play a most

important part in its development; and persons who look and feel prematurely old are likely to be seized with intractable neuralgias. Malaria is a potent cause; so are sexual excesses (whether legitimate or criminal), too frequent pregnancies, prolonged nursing, and other exhaustive influences. When one is subject to neuralgia, an attack may be excited by cold, damp cold, anxiety, and other depressing influences. Local disease may influence neuralgic suffering on some remote nerve-trunk, as a decaying tooth causes pain over the eye, womb troubles provoke pain in the top or back of the head, indigestion or worms cause pain and cramps in the legs or chokings and croupal cough, etc.

Attacks of neuralgia have been thus described: "After some little preceding numbness, blunted sensibility of the skin, or other disturbance of sensation, the meaning of which gets to be well understood by persons liable to neuralgia, the patient is seized with pain,—which at first is not severe and ceases quickly, but returns in a few seconds or minutes, lasting for a short time and then remitting. These darts revive with shorter and shorter intervals, so that in a little time the pain seems to be almost continuous, or interrupted only by waves of intensity, and it will last for some seconds or more than a minute together. Then comes a respite, to be followed by recurrence; and these alternations may continue for a few minutes or as many hours. In attacks of long duration the pains gradually get less acute, the intermissions longer, and the outbreak slides off into a confused feeling of discomfort and bruising about the seat of pain, coupled with a sense of exhaustion and desire for sleep. The character of the pain varies. It is described as darting like a knife or like lightning, crushing, hammering, boring, and sometimes burning. In neuralgia about the head, the patient will often be seen to cringe and recede before the plunges of pain, as though he were receiving blows. Pallor of the skin along the affected part, followed by intense redness and other evidences of disturbance in the blood-vessels, are common. Sensibility to touch is almost always diminished after a time in the neighborhood of the affected nerve, though at first there is some increase of sensibility."

In *tic douloureux*, facial neuralgia, the swift flashes of pain may be preceded by feelings of discomfort, or may have a sudden outburst without any warning whatever. The paroxysms are at first brief; but may return with increasing frequency and severity, embittering a long life with their constantly repeated attacks. The

suffering may be distributed over the cheek, or along the temple, or in one eye and brow. "Brow ague" is a form of this neuralgia commonly due to malarial influences. Women often suffer it in varying degrees during pregnancy, and after confinement, and at the change of life,—giving neuralgic tooth-ache without inflammation or decay about the teeth, yet not unfrequently with peculiar tenderness of these, swelling and sensitiveness of the lip and nostrils, increased flow of saliva, and pains darting along the jaw and elsewhere. In severe facial neuralgia, the sufferer gradually becomes highly sensitive, and a paroxysm may be provoked by trifling excitants, as a current of air, a sudden noise, laughing, talking, blowing the nose, coughing, a strong light, etc. Some extreme or prolonged cases are likely to develop various spasmodic actions about the parts; and the attacks to leave a partial paralysis which causes the cheek or eyelid to droop for days.

Sciatica is most common from the thirty-fifth to the fiftieth year of life. It may affect the buttocks, the back of the thigh, the knee, any part of the leg, or the whole foot except its inner border. Its course may be of the most violent character,—no posture affording relief from the agony, sleep being nearly impossible, the general health suffering, and the patient being prostrated with an attack for weeks. Other cases are less violent but more continuous, the pain being dull and distressing, increased by fatigue or worry, slowly wearying the patient, and gradually increasing in severity with advancing years. It is common for wasting of the limb to appear in sciatica, and at last a sort of half paralyzed condition that leaves the person more or less lame for life. Rheumatism is its chief promoting cause; but its suffering differs in that it comes on spontaneously, while the muscular pains in rheumatism are dependent on movements or use of the limb. Among other predisposing causes are anaemia, the prolonged use of liquors, malarial poisoning, syphilis, gout, fatigue, and a damp and cold climate. Once developed, it may return at any time, the severer forms in attacks after but a few days or weeks; but sometimes it leaves the patient for years, or may disappear entirely after one attack. It may be excited to a new paroxysm by exposure, coldness, fatigue, over-walking, strains, concussion of the spine, pregnancy, etc.

Treatment.—A first requisite in every case of neuralgia, is to ensure full and wholesome nutrition of the system. Impoverished and impure blood lies at the bottom of so many if these terrible

sufferings, that its purity and nutrient powers should receive immediate and constant attention. It will be a rather hopeless undertaking to relieve neuralgic pains, if the blood remain thin and poor, or charged with humors that depress the system. Hence it is necessary, first, to see that the stomach and intestines are brought into good and steady action, so that the two forms of digestion shall be performed well. Even action of the bowels and liver must also be maintained. In no case must these organs be forced to hurried and excessive labor, but sustained in that even and moderate way which is natural. Sufficient directions for such management have been given in the chapters on anæmia and dyspepsia. When chronic rheumatism is at the foundation of the nerve trouble, the course directed for that malady is to be followed. If the system is laden with impurities, whether of *specific* origin or otherwise, a course of alterative tonics and warm baths must needs be pursued.

At the same time the general modes of life must be regulated with constant reference to building up the tone and vigor of the system. Food must be used in such quantities as can be digested easily; and must always be selected so as to accommodate the powers of the stomach, yet be of the most nourishing class that can be used. A moderate amount of animal foods is very necessary, including cream, butter and eggs, when acceptable. Meats must be only moderately fat, and cooked in the modes that afford the greatest ease of digestion. Meats fried to crispness or brownness, and in much fat, are ruinous to the stomach at all times, and perhaps never do more direct mischief than to persons inclined to some form of neuralgia. Pastry is equally injurious. Fatty articles are usually needed, daily, in moderate quantities; though with some persons the quantities must be very small, while others can use them quite freely. Cream, or rich fresh milk, are generally excellent; though it must be remembered that some persons do not thrive on them, while to a few persons they are very objectionable. In like manner, some of the emulsions of cod liver oil are at times useful, though oftener quite repugnant to the stomach.

Farinaceous foods are suitable, mingled in fair proportion with animal foods as directed in the first part of this volume; but it would be absurd to attempt to use an excess of starchy foods for this class of people. Often the system calls for mild vegetable acids, as oranges and cooked apples and other tart fruits; and when bread, potatoes, and similar farinas are used pretty steadily,

and possibly a sweetish saliva accumulates in the mouth, an occasional and somewhat regular use of the milder acids must not be forgotten. The limited digestive powers of most of these sufferers commonly demand a little light nourishment between the regular meals,—as a glass of broth (warm), or of milk, or a piece of milk toast with butter, a little Mellen's Food in milk, or something similar.

Neuralgic people are very sensitive to atmospheric changes, and keenly feel little drafts or variations of temperature that are not noticed by persons in good health. Such evidences of sensitiveness are not whims, to be laughed at, and resisted, and overcome by exposures. They are real sufferings of diseased nerves; and although they may indeed be exaggerated by too extreme a degree of coddling, they are to be prevented and lessened by constant watchfulness. No matter what other people say, the neuralgic sufferer must guard sedulously against exposures, drafts, cold and damp air, chilly rooms, and similar provocative influences. He must also be warmly clad, especially with woolen garments close to the body,—wearing extra heavy drawers for sciatica, close-fitting garments or bandages about the pelvis in neuralgia of the womb, shielding the face and head when the pain is in these parts, etc. And any sudden changes in the weather, so common in our country, must be met by a prompt addition to the clothing. Some form of thin woolen goods should be worn next to or near the skin, even during the summer, and the change made to a heavier fabric even for one day of chilly winds.

As many neuralgias are developed and continued by habits of life that impose prolonged taxation upon the nervous system, these habits must be changed or greatly modified. Those leading a sedentary life,—as clerks, bookkeepers, teachers, seamstresses, etc.,—must obtain more out-door life, or in time be forced to change their occupation altogether. Business men must limit their anxieties and get abroad more; and those burdened with sorrows must make every effort to cultivate more calmness and resignation ere they break down into hopeless invalidism. Peace, quietude and happiness of mind, with freedom from annoyance, anxiety and worriment, are valuable in neuralgia as in nervous exhaustion. As recovery is very slow when the general tone of the system has been much run down, all these regulations of the daily life must be prolonged over many months, and sometimes through many years.

Direct medication for the relief of neuralgic suffering is to be of the sustaining as well as the soothing class. There is always a strong temptation to use laudanum, opium, morphine, or some other narcotic. Such articles will of course bring a present relief; but they do so at the expense of final nervous integrity, ending in greater disease of the nerves than existed before, and probably engraving an opium habit that to a well-balanced mind is more to be dreaded than any form of neuralgia. Better, immeasurably better, to endure some pain for a time, and put the disordered nerves "to rights" in a natural and safe way; than to get a merely temporary relief that blunts the sensibilities without ever *curing* any neuralgia, and in doing this lay the foundation for a much more grave and incurable state of things for the future.

Applications over the track of the suffering nerve are of much value. The Nervine Liniment is most suitable for this purpose, or may be made more stimulating by adding a little more cayenne. Some persons need a large amount of stimulation outwardly; but delicate and sensitive people may do best without any cayenne whatever. A very concentrated decoction of mullein leaves, to which one-fourth part of the Nervine Liniment is added, is very useful. Such applications may be made two, three or more times a day,—perhaps before the fire, and always covering the parts afterwards with a couple thicknesses of flannel.

After using such medicaments as may be required for rheumatism, impure blood, or other provocative form of disease, as already named; nervine medicines are to be given for the nervous system itself, and a portion of these must always be of a tonic character. An infusion of four parts lady slipper, two parts blue cohosh, and one part scullcap, made pretty strong and given in doses of a tablespoonful or less every two hours, is usually reliable. Or the preparations cypripedin, caulophylin and scutellarin may be mixed in those proportions; and the bulk of one to two peas of the combined powders given every two or three hours. In malarial districts, an equal bulk of salicin may be added to each dose of this powder; or four parts of Peruvian bark may be added to the other ingredients in making the infusion above named.

CHAPTER XCVII.

NERVOUS EXHAUSTION. NEURASTHENIA.

OF late years, the term *Neurasthenia* has been given to a trouble as old as the history of medicine. It is simply a state of general exhaustion of the nervous system, always accompanied by varying degrees of over sensitiveness,—for as the natural strength and tone of the nerves diminish, their excitability pretty uniformly increases. It is a condition oftenest developed in brain-workers, and in those whose pursuits are sedentary without sufficient muscular activity and exertion in the open air. Women exhibit it far more frequently than men,—teachers, seamstresses, milliners, and ladies with little or nothing to do. Overwork with brain and nerve, and underwork of muscles and lungs, throw the general harmony of the system into confusion and disorder; and then begin failure of digestion, persistent constipation, disturbances and deficiency of nutrition, paleness, thin blood, anaemia, wakefulness. When these feelings have developed, there follow the peculiar and annoying irritability and over-sensitiveness, the nearly continuous sense of tiredness, and the utter weariness on trifling exertion, that mark the state of nervous exhaustion.

All these conditions come about slowly, and are very persistent. They are accompanied by an almost innumerable variety of ill feelings, according to the habits of the person and the influences which have led to the exhaustion. With one class, the bad feelings are in the brain; with another in the spine, suggesting spinal irritation; with another there will be hysterical evidences, and with yet another class there will be neuralgic tendencies flitting from place to place. But while these classes of symptoms are suffered in almost endless degrees and forms and variations; there remain through them all the disorders of stomach, bowels and liver, the anaemia, and the constant weariness just mentioned.

. Instances of nervous exhaustion have multiplied greatly within the last half century; for the prevailing modes of life and of business make excessive demands upon the nervous system, against which it is a constant and severe and uncertain struggle for the body to hold its own. Business is conducted with such hurry and rush, or in such vast proportions, as to wear out and break down the system at a time in life when men should be entering their period of largest capacity and endurance. Scholastic and literary

pursuits are followed in the same driving fashion; and the brain is wearied and rendered helpless through fatigue, at a time when the fulness of mental exertion should commence. Taxations are heaped upon accountants, correspondents, journalists, teachers, clerks, seamstresses, and other sedentary laborers,—who are expected each day to do far more than the body can reasonably endure; and who struggle ambitiously, or under the compulsion of daily necessities, till the jaded nerves give down under the strain. Hurried eating, poor or ill-cooked food, a constant sense of anxiety or dread of losing a position, together with the insufficient muscular exercise and out-door life already mentioned, help on the nerve weariness till the balanced adjustments of Nature are broken. Suddenly, as it appears to them and their friends, the exhausted system fails; and the men and women who have exhibited so much capacity and energy for years, are found to be now without capacity and without strength. For years to come, they will struggle against the disheartening conditions of nervous bankruptcy.

Recovery from such conditions is very slow. The first requisite is *rest*. Business and care and anxiety must be laid aside, and the mind and nerves allowed every opportunity for quietude. Muscular exertion, which was so very much needed before, can now be taken only in the most cautious manner; for the general strength can spare but very little to these efforts. Study, reading, and even prolonged conversations, have to be forbidden in many cases; for these make demands on the nerves and prove wearying. Many do not understand these facts, and advise or provoke these debilitated ones to mental efforts that would really be exhilarating to those in health, but which soon weary them. In like manner they are urged to "take exercise," when all attempts to do so must be restricted to mere trifles. I have known numbers of these neurasthenic patients who could not read a page, nor listen to ten minutes reading, nor listen half an hour to others talking, nor be burdened with the care of their bed-room, nor sew on a few buttons, without becoming wearied and "nervous" to a degree that was truly pitiable. And these were not people who sought excuses for idleness; but mostly among women whose nervous cares and efforts had been active, and whose innate energies had carried them far beyond their strength. Such sufferers very seldom receive the sympathy they are entitled to; for persons in good health and with a sound nervous system are prone to measure others by themselves, and demand of the weak what is possible only to the strong.

Next to rest come good light, plenty of fresh air, and plain food of the most nourishing character. The bowels must be kept open regularly, in part by daily injections of warm boneset infusion, in part by the use of such liver tonics as wahoo. Digestion is to be sustained by such articles as the Nervine Tonic; and some form of malt or of maltine used with the meals. By these methods the nerves will be soothed and strengthened, the system freed of material that has accumulated in it from torpid secretions, and the nourishing qualities of the blood improved as in anaemia. It may require months, and sometimes years, to put the body into good condition again. Massage would better be practiced on the very feeble; and muscular exercise resumed by them very gradually.

Brain Exhaustion, although in part belonging to general nervous exhaustion, has some features that entitle it to separate mention. It may be found among growing boys and girls, especially those of the nervous temperament, as a result of too much study at school, perhaps associated with too much and too exciting reading at home. Such children are ambitious, learn rapidly, and generally are pushed forward by proud parents and teachers. From the eighth to the twelfth or thirteenth year of life, they use in excessive brain-work the nutrient and nervous energy that should be distributed more evenly through the body. Stimulated, forced, and in various ways urged too rapidly in their studies, the brain wearies and the body fails, till finally they become pale, nervous, weak and restless. Appetite is lost, sleep is much disturbed and very unrefreshing, headache and a feeling of oppression in the head are much complained of and are nearly constant, disturbances of digestion become marked, flesh is lost, costiveness is habitual, there are general feelings of languor and lassitude, ordinary play wearis and is often avoided, the pulse is small and rapid, and the heart action may be much disturbed.

These symptoms advance gradually but steadily, and the failing health of the child becomes marked. Usually the eyes are prominent, with dark bands under them; ordinary exertions are burdensome, though frequently the child is scolded and forced to make them; the hair dies and begins to fall out; a fit of crying or a spell of melancholy is easily incited; and not unfrequently twitchings and other convulsive movements may be developed, and girls are especially inclined to some of the numerous forms of hysteria, or to St. Vitus' dance. Under the inordinate and unnatural forcing systems of our public schools to-day, the excessive

tasks demanded of children drive thousands upon thousands of them into this condition of brain exhaustion, ruining very many of them for years and some of them for life. Parents should insist on taking the management of the schools into their own hands, and see to electing school trustees who have a little sense as to how much hard study the average child can endure.

But pupils of more advanced years sometimes pass into this same condition, partly through their own ambition, and partly from the competition in classes and between colleges making the course of study entirely exhaustive. And the pressure of business, the mad pursuit of wealth, the anxieties and labors of political or professional life, the engrossing demands of some phases of society, frequently lead to this exhaustion. Wear and tear are too great and constant; time and opportunity are not given for recuperation; and eventually there comes a break-down more or less complete and prolonged. Evidences of indigestion probably appear first, then lassitude and prolonged headaches, a sense of tightness or numbness in the back of the head, prolonged wakefulness and inability to sleep, probably ringing in the ears and bright spots dancing before the eyes, heavy sensations in the legs, paleness, various disturbances of the heart, a tendency to faint or actual fainting, and obstinate constipation. For a time, the will may drive these people to their excessive labors, the stimulus of a strong motive bracing them up and carrying them through, despite abundant admonitory and warnings. But sooner or later, if they persist, the break-down comes,—perhaps suddenly; and possibly it may present itself in delirium, hypochondria, epilepsy, St. Vitus' dance, paralysis, or even as mania. In one way or another, the price paid by the constitution for too intense and prolonged over-work of the brain, is always great and serious.

Prompt and total relief from mental work is the only source of safety. Children should be taken out of school at the first evidence of this brain weariness. To persist in keeping them in school is at once cruel and dangerous. One or two years of freedom from study will probably save them in body and mind; and eventually they will be better scholars than if the change is delayed. Reading must also be nearly or entirely forbidden till the brain has had a perfect rest, which will not be under several months. Older people must, of necessity, promptly lighten their studies or business, and seek rest before breaking. If exhaustion is advanced, this rest must be immediate, total, and prolonged,—one, two or

more years being at times demanded. Then sleep must be in every way promoted, digestion sustained by mild tonics without stimulants, and constipation steadily attended to. Fresh air, and light muscular exercise carefully increased, are requisites.

CHAPTER XCVIII.

NIGHT TERRORS.

CHILDREN under ten years of age are sometimes troubled with a peculiar course of symptoms, to which the term "night terrors" has been given. Dr. C. West describes the attack as follows:

"A child who has gone to bed apparently well, and who has slept soundly for a short time, awakens suddenly in great terror, and with a loud and piercing cry. The child will be found sitting up in its bed, crying out as if in agony or fear; Oh, dear! oh, dear! take it away, father or mother? while terror is depicted on its countenance, and it does not recognize its parents, but seems wholly occupied with the fearful impression that has aroused it from sleep. In from ten minutes to half an hour, as the terror abates, it may become quiet at once and fall asleep; but frequently it bursts into a fit of passionate weeping, and sobs itself to rest in its mother's arms. In some instances a quantity of limpid urine is voided as the fit passes off. Usually the remainder of the night is passed in tolerably sound sleep; two attacks do not occur in the same night.

"Seizures of this kind may come on in a great variety of circumstances; and may continue to return for many weeks together, or may occur but a few times. As far as I have had opportunities of judging, they are never the indications of mischief arising in the brain, are always associated with some disturbance of the intestinal canal, and more or less obvious stomach disorder. In the majority of cases, constipation of the bowels exists." It may be added that such children have a sensitive state of the nervous system. While such attacks usually alarm the parents very much, there is rarely any real danger connected with them; and yet if neglected they may become established, and finally end in some attack of brain disease.

Lift the child at once and gently from the bed, speaking to it kindly and assuringly. Carry it about in the arms, or lie it down in a different position. Wash the face and temples softly with a cloth wet in cold water. In a short time the child will awaken to full consciousness. Prevent the attacks by keeping the bowels open with rhubarb and senna syrup; be sure that the diet is not too hearty, especially the evening meal; and avoid too violent and fatiguing exercise and much mental excitement, which interfere with digestion and with good sleep.

CHAPTER XCIX.

INFLAMMATION OF THE BRAIN.

INFLAMMATION of the brain, or *Brain Fever*, is a very rare affection, although it is sometimes spoken of as if a very common thing,—the headache and delirium of a bilious or other high grade of fever being mistaken for this inflammation. It is more common in hot than in cold climates; and is brought about by blows or other violence upon the head, exposure to the sun, violent and prolonged excitement of the mind, erysipelas of the scalp, the sudden drying up of an eruption or discharge upon the skin, and sometimes by a recession of rheumatism. Inflammation of the brain is an occasional complication of scarlet fever. It may result from an extension of severe inflammation of the inner ear.

Symptoms.—As the membranes enveloping the brain are involved in all cases of inflammation of the brain substance, the symptoms will resemble those common to meningitis or spotted fever. Intense and throbbing headache, redness of the face and eyes, an excited and somewhat wild look, dizziness, roaring in the ears, extremely acute and painful sensitiveness to the least noise and to light, constant restlessness, and wakefulness with the eyes staring, are the usual symptoms. In addition to these, vomiting is quite common; and a wild delirium is to be expected, the patient tossing about continuously. Marked costiveness is usual. The skin is very hot; the pulse is hard, rapid, of pretty large size and regular at the first. After a time, which is quite variable, the heat of the surface moderates, the pulse becomes slow and irregular,

and the patient passes from delirium into a more or less heavy stupor.

Such is the common history of these cases, the violent period lasting from four to seven or more days. Recovery may take place without the later signs of stupor and prostration; but most generally these deepen, and convulsions are probable at any time in children, or at a late stage in adults. Some very dangerous cases have but little excitement at the start; but rather come on with pallor, enlarged pupils, a wild look with mental dulness and indifference, repeated small vomiting, very marked prostration without much general disturbance to account for it, and soon decided apathy and stupor.

Brain inflammation is always exceedingly dangerous, and recovery is always doubtful. Some get well, but the majority die; yet a number of cases with violent symptoms are mostly inflammation of the membranes rather than of the brain substance, and these are likely to recover. Paralysis and softening of the brain are to be dreaded as fatal sequences. Some chronic cases of inflamed brain belong to the study of maniacal forms of insanity.

In distinguishing brain inflammation from some other maladies which partly resemble it, the following facts are to be considered: In delirium tremens, the attack follows prolonged alcoholic excess, there are violent tremblings and horrible illusions, and the persistent wakefulness is not accompanied by headache. Acute mania has very little or no fever, but little if any headache, no vomiting, and no impairment of the muscular strength. Children many times suffer acute indigestion and other disturbances of the stomach, which provoke a number of symptoms resembling inflammation of the brain. They have fever, vomiting, restlessness, delirium, listlessness, and perhaps convulsions. But delirium in a child is by no means as suggestive of brain troubles as it is in adults, and much less so if it occur during the night. In these stomach cases, the head is not at all so hot as in brain trouble, the arteries in the neck and temples do not beat violently, and the fur on the tongue and sour character of vomited materials is much more decided; and these symptoms generally abate in twenty-four to forty-eight hours, while the symptoms of brain inflammation continue to get steadily worse.

Treatment.—So nearly allied is inflammation of the brain to meningitis, that the treatment elsewhere directed for the latter malady is the proper one to pursue in these cases. It is customary

to apply ice or iced water to the head ; but I greatly prefer to make use of pretty warm water, and that quite freely. At the onset the bowels should be moved somewhat actively, and after that gently,—injections being mostly depended on for this purpose.

CHAPTER C.

APOPLEXY.

APOPLEXY is a state of pressure on the brain causing sudden stupor, brought about either by an extensive accumulation of blood in the brain vessels, or by the breaking of a blood-vessel in the cranium. It is most common after fifty years of age, and is then met with frequently ; in middle life it occurs occasionally, and a few cases have been met in early life. Fleshy and full-blooded people, with short neck and full abdomen, are much more subject to it than others ; and the more so if they have been in the habit of high living, hearty eating, given to the use of intoxicating liquors (even in moderation), and leading a rather indolent mode of life. Excessive brain-work predisposes to it by keeping the arteries of the brain greatly enlarged and over-active. But sometimes spare and prudent people suffer apoplexy, and those following heavy occupations,—the walls of all the arteries gradually undergoing changes which make them brittle, and then some small vessel within the brain bursting suddenly under a moderate increase of pressure upon it.

Most cases occur soon after a meal, and during sleep. The pressure of a full stomach upon the great blood-vessel (*aorta*) behind it, presses this against the spine ; and the downward circulation being thus partly interfered with is forced strongly upon the brain. But any strong brain excitement or pressure may cause fatal hemorrhage within the brain at any time. Among such provocatives are anger (and people of a florid build inclined to apoplexy are excited to fits of anger by the most trifling circumstance), sudden fright or danger, excessive joy, stooping posture causing an instantaneous check to the downward flow of blood, heavy lifting, straining during stool, etc. Some troubles on the left side of the heart, preventing a free circulation, also predispose to apoplexy. Constipation favors it, partly by demanding re-

peated straining at stool and thence gradual weakening of the blood-vessels. Elderly people accustomed to hard labor acquire a peculiarly weak state of the arteries; and these, as farmers and mechanics, are liable to apoplectic dangers if they attempt work before eating the morning meal.

Symptoms.—In cases of pressure upon the brain without hemorrhage into it, there are generally some premonitory symptoms warning such persons of danger. Among these are flushing of the face and eyes, heat of the head, throbbing of the vessels in the neck and temples, sometimes throbbing in the head. Such persons are commonly subject to these sensations, under ordinary provocation, for months or years before seized with apoplexy; and along with these come in constipation, heavy headaches, dizzy and swimming sensations in the head, untimely drowsiness during the day, languor and dullness, and perhaps seasons of dimness of sight. It would be well if such people would heed these warnings, and adopt that course in life which is best calculated to avert the impending danger. The attack is marked by a sudden loss of consciousness, perhaps while sitting in a chair or engaged in conversation, the sufferer usually falling. The face is generally flushed and turgid, sometimes pale. The pulse is full, regular and strong, but usually slow; respiration slow and snoring, with the lips and cheeks puffing; the limbs are motionless; the pupils of the eyes commonly dilated, sometimes unchanged, and not impressible by the light. Usually the patient can swallow, though with difficulty. Sometimes the sphincters become so relaxed that the urine and faeces pass involuntarily.

In a case of moderate severity, the duration of a first or second attack may be brief. In from a few minutes to half an hour there are signs of returning sensibility. The patient can be aroused to slight evidences of returning consciousness, the pupils respond to the light, the eyelids tremble or move, small voluntary movements of the limbs are made, he partially opens the eyes when spoken to, and tries to protrude the tongue when told to. When the attack is recovered from, there remain varying degrees of mental sluggishness, numbness of the limbs, and signs of paralysis in speech and motion.

An apoplexy due to bursting of a blood-vessel gives no premonition whatever, but comes instantaneously as a *stroke*. Unconsciousness is complete, the breathing slow and stertorous, and all sensibility lost. Some cases die in a few hours, but the majority

live from four to nine days without any return of consciousness. A limited number recover; but suffer more or less severe paralysis, mostly of one side of the body, and impairment of the mental faculties. It is not often that either the physical or mental powers are fully recovered after this form of apoplexy, even though the person live for years.

Sunstroke is, in a partial sense, an apoplexy; but in most cases is different in the rapidity of the pulse and the exhaustion of the nervous system caused by the heat. A person made unconscious by poisonous air,—as the foul gases of a vault or well, the escape of illuminating gas or gas from a coal stove into a closed room,—have a cold surface, blue lips, and embarrassed breathing. The condition of dead drunkenness is revealed by the odor of the breath; but an apoplectic sufferer, in cities, is sometimes passed by as if only drunk, and thus left to die without the help that might be given. Injuries upon the head, causing concussion of the brain, generally show marks of violence; and give a weak pulse and cold surface that do not belong to apoplexy.

Apoplexy of any form or degree is always alarming, for the question of full or even partial recovery is very uncertain. The more sudden the attack, suggesting hemorrhage within the brain and the true "apoplectic stroke," the greater the danger; and this danger increases with the advance of years. An attack of apoplexy from simple pressure is frequently recovered from, and so may be a second attack; but usually a third attack is fatal, though some persons who provoke these by too hearty eating may recover from several of them or die in any of them. When the "stroke" caused by inward bleeding is not accompanied by snoring and stertorous breathing, the person may recover; and the chances of recovery improve after the third day from the attack, though one cannot be considered out of danger till ten days have passed. Quite young persons may recover pretty fully; but the more advanced in years are most likely to be helpless from paralyses.

Treatment.—It is important to ascertain the direct cause of an attack, and then relieve it if possible. If a recent hearty meal has been eaten, its ejection by vomiting must be secured immediately. Although the act of vomiting throws some blood to the brain temporarily, this is of much less danger than the pressure caused by the loaded stomach impinging upon the blood-vessel behind it. Vomiting must be secured by large draughts of warm water with salt, or powdered mustard seeds, or both; for it needs to be in-

duced in the speediest possible manner, with regard merely to emptying the stomach. And such a sufferer must on no account be allowed to lie down, which will pretty surely be death to him by increasing the weight of the food upon the aorta. Keep him upright in a chair, loosen all clothing about the waist and neck, give plenty of air, avoid all excitement in the room, and then give the materials for an emetic promptly and rapidly as he can take them. If the feet and hands are cool, bathe them in warm water containing some mustard or red pepper or ginger, that stimulation may invite the blood away from the brain.

In all other cases, let the sufferer lie with the head somewhat elevated. If the bowels have not moved, give a pretty large injection of moderately strong boneset infusion, or of warm water, adding salt and some ginger; and this course should be pursued to move the bowels each day. Always free the neck from the pressure of clothing; and apply strong pepper or mustard baths to the feet and along the lower extremities, and along the sides of the neck, every eight or twelve hours. Then the patient must be kept very still and handled just as little as possible; and the room kept quiet and moderately warm, with abundance of fresh air. If the patient can swallow, he must be nourished sparingly with warm beef or chicken both every four or six hours, fed cautiously. If he cannot swallow, let nourishing injections be given. After three days, the pulse beginning to lose force, a *weak* infusion of golden seal and scullcap may be given in teaspoonful doses every three hours, to sustain the heart; or put into the nourishing injections. If there are no signs of returning consciousness, and no responses to attempts to nourish, the utmost stillness must be maintained, but the case looks hopeless. If there is a degree of recovery, the subsequent management must be by mild tonics, warm clothing, stimulating baths and friction, nourishing but light feeding, and daily evacuations of the bowels by boneset and ginger injections and butternut syrup.

Persons liable to apoplexy by build or by their age, should lead a life of the utmost evenness. It is not possible for them to be too prudent and circumspect. Business care, mental exertions, and hard physical labor, must be moderated greatly or laid aside altogether. Eating must be regulated with firmness, so that it shall be regular, moderate in amount, and perfectly plain. Few of these people are willing to be admonished on these points; for generally they are very hearty and rapid eaters, with strong appe-

tite and digestion, and given to indulging in very hearty foods. If they hope to escape trouble, they must use meats in great moderation and in the simplest forms of cookery; depend mostly on succulent vegetables and fruits; lay aside coffee and use sparingly of tea; refrain absolutely from all forms of spirituous and malt liquors; and compel themselves to eat but a small bulk, and to cut short their demands at the table. Nor should they lie down soon after any meal, and especially the evening meal; nor attempt work or exercise before breakfast, nor too soon after eating. They should carefully avoid constipation, two movements per day being much preferable to any delay in the function of the bowels. And they must learn to govern themselves rigidly in temper, and not give way to excitement and passion on every trifling provocation, as most of them are so prone to do. Many a man has dropped dead from apoplexy from a fit of passion that might easily have been avoided by due self-restraint.

CHAPTER CI.

MUSCULAR PARALYSIS. PALSY.

Loss of motive power in muscles may be partial or complete; and may affect a limited series of muscles or involve a large range of them. Partial paralysis of the tongue, eye lids, and other parts, may follow diphtheria and meningitis; of the hand and arm from over-use (*Writer's Cramp*); of the wrist from lead poisoning, which may cause wasting and perhaps permanent disability of the parts. Hysteria, epilepsy and St. Vitus' dance sometimes are accompanied or followed by considerable paralysis; but when the loss of muscular power is due to these causes, it is usually temporary and its removal may be expected quite confidently. Paralysis from diphtheria and meningitis generally disappears after a time; but in some instances it may be permanent, or may prove fatal by attacking the heart or the muscles of respiration.

According to its extent and position, paralysis has received different titles, as Facial, Hemiplegic, Paraplegic.

Facial Paralysis affects one side of the face, usually in consequence of pressure on the nerve as it leaves the cranium behind the ear to be distributed to the muscles of that side. The muscles

of the affected side having lost their power, those of the sound side act without being antagonized; and so the cheek and mouth are drawn toward the *sound* side, while the other or paralyzed side remains without expression and immovable, and probably the eye on that side remains open from lack of muscular power to close it. The tongue is not affected.

In general, this form of paralysis is overcome in a few days, or at most in a few weeks. Giving the face such an unpleasant appearance, it is apt to create alarm lest it proceed from the brain. But when changes in the brain cause paralysis of one side of the face, there are always decided head (or mental) symptoms, and loss of power over the tongue; and both these evidences are wanting in simple facial paralysis. It may be managed by Stimulating Liniment, or a milder stimulating application, on the bony prominence behind the ear two or three times a day. When recovery begins, use the Nervine Liniment; and protect the ear and face from cold by warm covering, as a layer of wadding or of flannel.

Hemiplegia is that form of paralysis which affects one side of the body. It most frequently follows an apoplectic stroke or other serious trouble within the cranium, but occasionally it results from disease of the upper parts of the spinal cord. In rare instances, a transient and not serious form of it may result from hysteria, epilepsy, or St. Vitus' dance, as already mentioned.

It comes on suddenly, without warning, and in the great majority of instances with loss of consciousness. Power of motion on one side is lost, and more or less the power of feeling. In *complete* cases, the arm, leg, muscles of mastication, muscles around the mouth, and one half of the tongue, are involved. The cheek and lips on that side hang down; but the eyelids can be opened or closed at will, although both eyes are likely to be turned toward the side not paralyzed, and the head also turns toward that side. If the patient attempt to protrude the tongue, it is by the sound muscles pushed toward the affected side; while in drawing it into the mouth it is pulled toward the sound side; and the speech is "thick." When this paralysis is *incomplete*, the arm is usually more affected than the leg. Control over the bladder and lower bowel is generally retained when any degree of consciousness remains or returns; but sensibility of the affected side is more or less diminished for a considerable time after the commencement of the disease. As a rule, the muscles of the trunk are affected comparatively little. From the peculiar arrangement of the fibres in the

brain, the paralysis of one side of the body is due to disease or pressure on the opposite side of the brain.

In slight cases, several days or a week or two may begin to show less thickness of speech, less flabbiness of the cheek, and an increase of sensibility on the surface; and then there slowly returns some power to move the arm and leg. Recovery may gradually take place to a considerable extent, but insufficient control over the extremities is generally continued a long time. In the more severe forms, not proving fatal, any recovery of power in the limbs may be delayed for months; and then perhaps the degree of recovery may be very slight, and never improve beyond this small extent. Recovery shows itself in the leg sooner than in the arm, and in the muscles near the trunk sooner than those more distant.

As the great majority of these cases depend on apoplexy, the same general course of management is to be adopted as has been given for that affection. Rest, and judicious regulation of the bowels, are to be had; it being imprudent to try to force these patients to use the limbs beyond the degree attempted by their own anxiety to recover. Outward stimulation along the affected limbs is of much use, and may be made night and morning. For this purpose, the Stimulating Liniment, an infusion of red pepper in water and vinegar, and similar applications, are suitable. It is a common belief that electricity in some form is very valuable; but in fact this is an error, and only in protracted cases of paralysis having its origin in hysteria or similar nervous trouble, is electricity of any service. In most instances it is likely to be a decided disadvantage to employ it, and especially to use the magneto-electric machine (which turns a magnet with a crank). As these patients are not always sensitive to the electric current, although a few of them are over-sensitive, the battery or the magnet force may be used to a degree that is almost destructive to the little remaining life in the motor nerves. By remembering that the seat of the trouble is within the cranium, as shown by the mental disturbances, it will be realized that no current of electricity in the limbs can rectify the source of the paralysis.

Paraplegia is paralysis of both the lower extremities, and is due to disease or injury affecting the spinal cord, without of necessity involving the brain; although sometimes the brain is implicated, and there are mental disturbances in consequence. It generally begins suddenly with strange tingling or numb sensations in the limbs, pain in the back, and signs of early loss of motion. Further

muscular loss may be partial or complete, and may advance rapidly or gradually. During its progress, pains with muscular twitchings and cramps in the limbs are common; and finally, in cases that steadily get worse, there is loss of power over the bladder and the bowels. The water may not pass until the bladder gets full to distension; and then it continuously dribbles away by overflowing the bladder. The bowels move only with difficulty, and on the use of stimulating injections. In prolonged cases, bed-sores are pretty sure to occur unless the greatest precautions against them be taken; and if the paralysis is profound the circulation is too feeble to prevent bed-sores, and deep ulceration and extensive sloughing are quite sure to occur about the buttocks. In most instances the muscles of the limbs are relaxed and flabby; in a few cases they are contracted. The surface is cool, sometimes very cold; and sensation may be lightly impaired or nearly lost. Some cases recover to a limited extent after many months, a few recover more fully, some never improve but slowly pass on to death.

Treatment is very unsatisfactory. Every care must be taken to move the bowels daily or every second day. Urine must be drawn away with the catheter every six hours, regularly; and the fact of its dribbling away involuntarily is but the greater evidence that the bladder must be emptied thoroughly by the instrument and no fluid be left in it to decompose. Beds and bedding must be cared for with the most scrupulous cleanliness; no feathers being used under the patient, but a soft and very even cotton mattress on springs provided, or a water bed. No moistness must be allowed to remain about the body. Diet must be of easy digestion but fully nourishing. Two or three times in twenty-four hours, the spine may be rubbed gently with a moderate amount of the Nervine Liniment. Bed-sores are to be prevented, if possible, by the measures directed elsewhere. Electricity is often employed; but it is advisable only in cases that have continued for some time and then in but a light current.

Lead Paralysis is caused by the slow introduction of lead into the system, chiefly noticeable among those working in manufactures of this metal,—mining, smelting, paint-works, etc. It is common among house-painters; though the use of benzine instead of turpentine in mixing paints is said to diminish the liability to it, but more probably the larger employment of other pigments has lessened its prevalence among painters. It has been introduced to the system frequently, in quantities sufficient to poison seriously,

by lead pipes in cisterns, and by hair-dyes and washes,—which usually contain a notable quantity of this metal, as abundantly proven by competent analysis.

The most common form of lead paralysis is the form of poisoning called *lead colic*. Paralysis of the muscular coats of the bowels is present to a greater or less extent, accompanied by paroxysms of the most excruciating pain and obstinate costiveness. The patient has a pallid and blue look, shrunken features, a blue line along the gums, heavily coated tongue, foetid breath, cold and clammy skin, very scanty urine, and shallow breathing. Nausea and vomiting are common, the abdomen is drawn inward at the navel and feels hard.

More general lead paralysis shows itself in a peculiar inability to raise the hand, which drops at the wrist by its own weight, hence called "dropped wrist." It advances to the limbs and trunk, giving a peculiar trembling or tottering gait (whence the term *lead palsy*), drooping or stooping of the body, swellings of the tendons about the joints, and slow wasting of the affected muscles. It is usually preceded by one or several attacks of lead colic, but may occur without any signs of colic. Severe pain in the affected muscles precedes their palsy, and also attends recovery of power. The blue and wasted appearance of lead colic is present.

Treatment consists largely in prevention. A *very* liberal use of fresh milk is asserted to be an almost certain prophylactic, and is now largely adopted by workmen of this class. The utmost cleanliness, never eating in the workshop nor with unwashed hands, and the procurement of free ventilation, are leading rules for prevention. In lead colic, large doses of anti-bilious physic or other stimulating cathartic must be used to move the bowels freely, probably aided by boneset and ginger or soap injections; and the Nervine Liniment over the bowels every three hours, with hot flax-seed and ginger poultices; and a warm infusion of lady slipper, dioscorea and a little ginger in small quantities as frequently as the stomach will accept it. Milk may also be used liberally. In chronic poisoning, milk, electricity every day or twice a day, and suitable cathartics, generally give relief, though cure is slow. Men thus poisoned *must* be removed from the works. It is not at all probable that any antidote to this poisoning is known, but sulphur baths help to eliminate this metal from the system.

Shaking Palsy consists in an involuntary and nearly constant shaking of the hands and arms, perhaps slowly extending to other

muscles. It is generally connected with a certain wrecked condition of the spinal nerves in advanced life, and often of the brain also. The sufferer is helpless, and no relief or cure seems possible.

CHAPTER CII.

CONVULSIONS. SPASMS. FITS.

THESE different terms are given to different classes of involuntary muscular contractions, coming on suddenly, during which the muscles may be rigid or thrown into various jerking movements, the mind being more or less distinctly disturbed. No certainty exists as to their recurrence; they may appear at any period of life, but are most common during infancy and early childhood; and persons thus afflicted may die during the fit or soon after as a consequence of it, yet by far the majority recover though possibly subject to other attacks.

Probably in all cases there is a morbid irritability and excitability of the nervous system. In children, this unnatural sensitiveness may be inherited from the parents or grand-parents, along with a tendency to convulsions; or it may depend upon constitutional feebleness and a low state of vitality, either inherited from one or both parents, or acquired by habits of life and insufficient food, or due to the prostration following measles, whooping-cough, and other enfeebling diseases of childhood. In adults, the tendency may be the result of sympathy with diseases of the womb (as in the hysterical spasms of women), or of prolonged worriment, anxiety, mental over-work, etc. If the tendency exist, a large variety of circumstances may provoke a development of the convulsions, such as fright, injuries about the head, some diseases of the kidneys, the peculiar excitements of puberty, the menstrual periods and pregnancy in women, etc. In young children, spasms in some form may take the place of the delirium of adults; hence it is not uncommon, with them, for an attack of scarlet fever or other acute disease to be ushered in by convulsions.

As the spasms of adults generally result from some special or constitutional disease, this must be ascertained and treated. In this chapter I especially refer to the convulsions of infancy and childhood; and the management of these, during the existence of the spasms, is suitable for adults also.

The provoking causes of spasms in children are numerous. By all odds the most common are indigestion or the presence in the stomach of undigested food, constipation, worms, the irritation of the gums in teething, and fright. A nursing child may have spasms from drawing the breasts of a woman who has just had strong fright, excitement, or spasms. Prolonged playing, as running and jumping the rope, may be followed by spasms of a severe or serious character. Disease within the cranium of a child is very likely to begin with spasms; or the spasms themselves, during which the mind of a child is disturbed, may overwhelm the brain in some degree, and either lay the foundation for future attacks or prove fatal at the time. On these accounts, infantile convulsions are always to be looked upon with apprehension, and every precaution taken to guard against repetition.

Usually, a fit gives warning of approach by unusual fretfulness, restlessness during sleep, or gritting the teeth. The attack itself comes on suddenly. The muscles of the face twitch, the body first becomes rigid and then is thrown into jerking movements, the head and neck are drawn backward, and the limbs are bent and stiffened by turns. Consciousness is absent, sight and hearing are lost, breathing is hurried or labored, the surface is bathed with perspiration and is usually cold, the pulse is small and very frequent. Sometimes the limbs move but little, the body is rather rigid, the eyes roll spasmodically, and the countenance is much altered,—which cases are generally spoken of as “inward spasms.”

After a few minutes, which seem very long to anxious parents, the spasms moderate and then cease entirely. The child passes into a quiet sleep, or becomes conscious and then bewildered for a time. One attack may be followed by another, at short intervals, for hours together; and the child finally pass out of them. There is always a possibility that attacks may recur at uncertain intervals for months or years; and thus a habit of the system may be established or epilepsy be developed. Every effort, therefore, must be made to guide such children correctly, so as to avoid these recurrences and overcome their tendency.

Treatment.—In any convulsion whatever, loosen the clothing about the neck, chest and waist; and lie the patient upon his back with the head lifted upward somewhat. Admit a very full supply of air to the room, yet have no direct draft over the patient. If the head is hot, apply cool water all over it by lying on wet cloths, and renew these every two or three minutes till it gets cool. Place

the child in a tub or other bath of quite warm water, if the fit last long enough to get this ready; and lave the water freely over the chest. It may remain in the bath ten or fifteen minutes, or till the spasmodic jerkings cease; and then should be wrapped quickly in a blanket or quilt, handling it as gently as possible. Such a bath may be repeated if the spasms show signs of returning.

Any provocative cause of the spasms should be removed. If the bowels have been constipated, or if the abdomen is large and tight, give an injection of soap and sugar, or of salt, to stimulate a prompt discharge. If a hearty meal has been eaten within two or three hours, induce vomiting by warm water containing a little salt, giving a few teaspoonfuls every four or five minutes, and about every fifteen minutes giving a teaspoonful of neutralizing cordial or a very little cooking soda in water. Possibly worms have risen into the throat, when salted water will be most suitable to drive them back. Mustard plasters are sometimes applied to the feet and over the stomach, when the head is very hot and the extremities are cold; but I much prefer washing these parts with a strong infusion of ginger, or a very weak one of red pepper, or with the Nervine Liniment. If the gums are swollen and red from teeth that are slow in coming through, promptly cut quite down to the tooth with a sharp knife,—in a line with the edge of the tooth, and not crosswise of it; but promiscuous cutting of the gums is cruel and useless.

After the spasms, let the child be quiet; or give it an infusion of lady slipper every half hour if it is restless. This may be continued every hour or two for several days, if the child continue irritable. Regulate the bowels with magnesia or large doses of neutralizing cordial; and let the food be plain and limited. Such children subsequently need a light and simple diet, as much outdoor life as possible, freedom from excitement, and the Nervine Tonic or other mild tonic to bring up the digestion and strength.

Cramping of the Leg, usually troubling the muscles of the calf and foot of one limb in the night, is due to indigestion, constipation, or other derangement of the bowels. An attack is at times relieved by putting the naked foot suddenly upon the cold floor or oil-cloth. Rub the knotted muscles upward, slowly and with hard pressure. I have successfully adopted the plan of grasping the upper part of the calf very tightly with both hands, and holding it so; or of wrapping a soft string about it and drawing this firmly. Another method I have followed, and which in my own person is

always successful, is to turn the foot by the will strongly in an opposite direction to that it is inclined to by the cramps. Thus, the cramp bending the foot downward, let the sufferer bend it firmly upward; the cramp turning it inward, let him turn it outward, etc. It requires a strong will to do this; but it is quite effectual, and may follow wrapping the calf with a string. Persons thus troubled, should guard against constipation and indigestion.

CHAPTER CIII.

SAINT VITUS' DANCE. CHOREA.

CHILDREN from eight to twelve years of age are most frequently troubled with this curious malady, and girls twice as often as boys. It is very rare before the sixth year, and seldom continues after puberty; yet occasionally it is met in some form during adult or even through advanced life. It generally occurs in families where the nervous temperament is strongly marked.

St. Vitus' dance consists of irregular and jerking movements of some of the muscles, oftenest of the arms but moving to other parts and groups, thus occurring in nearly all parts of the body. No rythm is observed in these movements, which occur without any order or method. While the movements are wholly involuntary, and made suddenly without any purpose of the will, there is not actual loss of command over the muscles although the will cannot prevent nor control the motions. So sudden and unexpected are the jerkings, that the most grotesque actions and positions are caused by them; and the efforts to govern them merely intensify these. Hand, arm, head, leg, or other part is thus jerked in the strangest imaginable ways. As a rule, these movements all cease during sleep, and sometimes do so when the person sits down.

It is during the first period of development in a child's nervous system, that most cases of this malady arise; probably because that development is inharmonious, and too great tax is put upon it by study or it is not nourished well. Before the chorea shows itself fully, the child is often rather "giddy" in manner, lets things fall or jerks them about in strange ways, becomes indifferent to her clothing and general appearance, receives many a scolding for her

carelessness in handling and breaking things, at first cries over the scoldings and then becomes callous to them. Such changes in the manner and habits of a girl are annoying to mothers, but should warn them of the possibility of an approaching nervous trouble that will be hastened by scolding and harshness. A sudden fright, or some sharp punishment, will then start the chorea; and so may prolonged jumping the rope or other severe exercise in playing, a blow or a fall, or other strong impression on the nervous system. No small number of cases follow an attack of rheumatism, and this is the more likely if the rheumatism affect the heart in any way. Heart-strain may also be followed by St. Vitus' dance.

Reasonable care is pretty sure to end most attacks in from four to six weeks; but some severe cases last several months unless managed with much prudence, and carelessness or harshness of treatment may fasten some form or degree of it on the child for many years. It is very rarely fatal; but may prove so if connected with distinct heart disease, or if allowed to grow into a brain complication.

Treatment.—No such child must be continued at school or at study; and it will be wise in parents to recognize the peculiar awkwardness spoken of, and take the child from school at once, and treat her with the utmost tenderness and gentleness. Scolding is peculiarly damaging, under these circumstances; and no amount of mishaps should induce the parents to inflict punishment or use harsh words. In everything, bear the accidents and awkwardness with patience and with encouragement, and never utter a reproof. It is simply impossible for the child to escape breaking dishes and upsetting things generally. The child should also be moderated in her plays, if disposed to fatigue herself by them; yet moderate play and exercise are positive necessities.

As most of these children lose ground in their nutritive processes, it is important to give them food easy of digestion and of the most nourishing character, as already spoken of in the chapter on anaemia. Regularity of the bowels must also be maintained, as by butternut syrup. Sometimes the bowels are too loose, from indigestion; and this is to be checked by the Neutralizing Cordial and Compound Bayberry Syrup in equal portions, three or four times a day. Feeble digestion, nearly always present, is to be managed by the use of Maltine at meal times, and the Nervine Tonic after meals. Between the meals, an infusion of four parts lady slipper and one part black cohosh, given in moderate doses

each second hour, is of great value. In some adults, I have used the Mother's Cordial steadily as a tonic, with a grain of cimicifugin midway between meals and at bedtime, with excellent results. The clothing of a child should always be warm without being burdensome, and the legs well clad.

CHAPTER CIV.

EPILEPSY. FALLING SICKNESS.

THIS term is applied to a form of convulsions in which consciousness is lost for a short time, the attack coming on suddenly and the patient usually falling. The attacks return with something resembling regularity, the intervals being long or short in different cases,—the frequency diminishing in those whose general conditions improve, but sometimes increasing to one or several a day in old and unfavorable cases. In most instances the mental faculties become more or less impaired as time goes by, yet this is by no means always the fact. An epileptic may live to a good old age, though liable to serious accident in some of the seizures if left alone. The greater number of these seizures commence between the tenth and twentieth years, the next greatest number between the second and tenth years, a few cases begin after the fortieth and fiftieth year. A number of eminent men have been subjects of epilepsy, among whom were Julius Cæsar, Mahomet, Petrarch, Isaac Newton, Peter the Great, Napoleon, and Byron.

Symptoms.—Probably the great majority of epileptics have some warning of an attack, these warnings being exceedingly various in character and degree. A sensation as of a current of air (*aura*) moving over some part, is common but far from universal. Distinct change in the temper, coldness of the feet, illusions or hallucinations before the eyes, and small spasmodic jerkings of some of the muscles, are among the most usual premonitions. In the long list that different persons will notice, are the following: Headache, backache, dizziness, disturbed sleep, palpitation, diarrhea, or sudden constipation, perspiration, bleeding at the nose or elsewhere, unnatural hunger or thirst, involuntary and spasmodic discharges of urine or faeces, cramps or trembling in the limbs, feelings of numbness or paralysis, a disposition to run forward or

around, and many others. Each person becomes aware of one or several such sensations or facts in his own case; and these may appear one or two days before the attack, or only a few hours or moments. Sudden drawing of the head toward one shoulder appears in some cases just as the seizure is coming on, and this mostly when there is brain disease.

The paroxysms may be light or severe. A light seizure may last for but two to five seconds, the patient losing consciousness but not falling; and at the same time having a fixed state of the eyes, slight contractions about the face, and some movements of throat and tongue as if swallowing. If walking, he continues to walk; if talking, he stops briefly as if merely taking breath; and then he goes on as before. Such light attacks usually are but fore-runners of the severe trouble, which may appear in a few months.

In the more severe attacks, the patient loses consciousness instantly; utters a peculiarly distressing cry, which is sometimes quite loud; and at once falls, either forward or back. The face is pale and blue-looking. Spasms of a violent and jerking character start everywhere, contorting the face, rolling the eyes, working the jaws, jerking the limbs, twisting the body, contracting the abdomen and bowels. He foams at the mouth, grinds the teeth with danger of biting the tongue, breaths laboriously, sometimes vomits and has involuntary discharges. In a few moments the face is likely to become more or less purple with blood, the cold skin gets warmer, and a profuse perspiration breaks out.

Such a seizure, which is always very distressing, may last from two to ten minutes. As the spasms abate, the patient becomes limp and exhausted. Some confirmed epileptics get up almost at once and walk away, showing a little mental confusion for a few minutes only. Others are lethargic, with heavy breathing, seeming half paralyzed, passing into a stupid sleep for half an hour or much longer, with the heart beating violently. When full consciousness returns, whether with or without this heavy sleep, the sufferer has more or less severe headache, aching of the limbs and trunk, feelings of lassitude, and mental confusion that bears no proportion to the severity of the attack. While these are the customary sensations, they differ very much in degree and length of duration. Mental disturbances are the most varied of all the symptoms, dullness and indifference being prolonged in some cases and almost wanting in others; alienation of mind following in some, and never being apparent in others.

Like other nervous diseases, epilepsy has a foundation in some unknown condition of the nervous tissues; and when this exists, a large variety of impressions may provoke these peculiar spasms in those persons, but will not cause them in other persons. No other affection is more prone to heredity (p. 100); yet it is not, of necessity, transmitted to children, and it may be acquired without there being any taint in the family. Puberty, with its peculiar nervous emotions, has a marked influence in developing it; women thus inclined commonly have attacks at the menstrual times; and among other influences which more or less distinctly favor it are injuries about the head, fright, grief, and general poor health inclining to anæmia. Masturbation is too often a promotive influence, and the more so about the time of puberty.

It is exceedingly uncertain when epileptic seizures may occur. With many they observe an apparent, but not actual, regularity; but with others there is no semblance of regularity. Some have a fit every day; some, two or three each day; others, one in three or four weeks. Some of these people have an attack at any time, day or night; others have them only at night, or in the day. Dr. Sequard knew one case in which for ten years the average number of nightly fits had been twelve, making a total of more than 40,000 in the ten years; while in another case a man over 62 years had but seven attacks in his life, some of them at an interval of thirteen years.

Treatment.—During the fit, absolutely nothing can be done beyond preventing the patient injuring himself. A knife handle or small stick placed between the back teeth, will prevent his biting the tongue. As the spasm passes off, he should be turned upon one side and the tongue pulled a little forward to prevent its falling into the throat and causing strangulation. Then he is to be left in quiet until such time as consciousness returns,—some sleeping stupidly for hours, others getting up in a few minutes and walking away.

If the patient have premonitions of the approach of an attack, and the warning is long enough to admit of some action, it can occasionally be checked. The steps taken will depend on the nature of the warning, and will be of no use the moment the attack has fairly begun. If the warning is an *aura*, a sensation of a current moving upward along the limb, tie a handkerchief or string around the limb quickly and firmly,—loosening and tying rapidly; not to arrest any actual current, but to make a sharp and strong

impression on the nerves. If it come as a sudden turning of the head or trunk to one side, catch the part and turn it quickly in the opposite direction. If diarrhea is found to precede the attacks, give large and frequent doses of Compound Bayberry Syrup, or any of the stimulating or astringing prescriptions named for diarrhea. If sudden constipation, anti-bilious physic or other quick purge; if nausea, lobelia with composition, or other prompt emetic; if cold hands and feet, plunge them suddenly into hot water, etc.

So, also, anything that causes disturbance and depression of the nervous system is to be avoided. Rapid and almost glutinous eating is a failing of some of these subjects, and must be corrected prudently. Suitable clothing to keep a warm surface in cold weather, strict avoidance of tobacco and spirits, firm control of amorous feelings, a quiet life free from study and excitement, and everything that will promote ease of mind and steadiness of the whole system, are to be followed sedulously according to the needs of each person. Should any derangement of menstruation exist, it must be corrected.

If the paroxysms return with any distinct regularity, the habit may sometimes be averted by the use of salicin in proper doses every three hours, beginning the second day before the attack. I have derived benefit from using golden seal and lobelia herb in equal parts, by infusion, a moderate dose every hour for twelve or more hours before an expected fit, or when premonitory signs are noticed. Lobelia lessens the tension of the arteries in the brain, and golden seal I have learned sustains the veins, and these two remedial actions are needed by most epileptics. On this account I generally use golden seal with twice or more its bulk of lady slipper, or in equal parts with lady slipper and dioscorea, pretty steadily between the paroxysms.

It has become quite the practice to use some compound of the bromides for these patients. These to some extent delay the paroxysms; but do it by withering the spinal cord and hastening mental decrepitude, and in the long run never *cure* an epilepsy any oftener than can be done by the above simple and safe management. In fact the bromides have no curative properties whatever, but only a treacherous form of sedation that finally injures the whole body as all other poisons do.

CHAPTER CV.

CATALEPSY.

CATALEPSY is a nervous disease in which power over the muscles is lost, consciousness is more or less completely lost, the muscles are inclined to be rigid and to remain in whatever position they may be placed. It is very much more frequent in women than in men, and may appear at any time in life,—usually being preceded by considerable nervous exhaustion, and then provoked by religious or other emotional excitement, sudden fright, or injury about the head. Some cases are preceded by headache, giddiness, or hic-cough; and persons who are liable to these seizures often have some such notice of their approach. The seizure itself is sudden, the entire muscular apparatus becoming stiff, and the limbs remaining as rigid in whatever position they occupy as if they had turned to wood. Consciousness may be lost entirely, or be in a confused condition. The countenance is without expression, breath weak, heart action feeble. After a time the rigidity partly yields; and then the limbs can be moved by using moderate force, but will remain in the condition placed. From a few minutes to an hour or several hours may be occupied with such an attack; which may pass off suddenly and with so full a return of consciousness as to give an impression of feigning, or it may pass off gradually and leave headache and dizziness. Women subject to these attacks are frequently hysterical between them, or mixed signs of catalepsy and hysteria may occur together.

Little can be done during the attack beyond efforts to arouse consciousness by at intervals applying ammonia or other pungent article toward the nose, that its impression may be made without being so close as to endanger suffocation. Sometimes a pinch of snuff succeeds, or electro-magnetism applied to a limb or to the spine a few minutes. In the main, however, the attacks need not be interfered with; but due efforts be made to build up the system between them. This is to be done by tonics, a generous diet, freedom from emotional excitements, and thorough regulation of the bowels. A firm moral tone of management is always necessary, not extending ostentatious sympathy; and often these patients cannot be cured until removed from home influences for many weeks or months.

CHAPTER CVI.

TRANCE. SIGNS OF DEATH.

CATALEPSY and trance resemble each other in loss of consciousness; but in trance the muscles are greatly relaxed with possibly very brief periods of trifling rigidity, the countenance is extremely pale, the eyelids are closed, and the eyeballs are usually turned upward. The pulse is very feeble, and any evidence of heart action may be entirely lost; the breathing is usually so tranquil as scarcely to be perceptible in any movements of the chest, and in profound trance cannot be detected at all. A seizure is usually very sudden, probably coming on in an instant during good health; and continuing a few hours or days, in some instances lasting through weeks and months. Central heat remains nearly normal, though the surface gets cool; the secretions continue in a limited degree, though the menses cease except in some rare cases. Recovery may be sudden or gradual; and is usually followed by a spell of nervous prostration and possibly some mental dullness.

Most persons know nothing of what occurred during the trance, all being to them as death-like as was their condition while the seizure lasted. But in some cases the patient is aware of everything transpiring about him, the conversation, the acts, the preparation for his burial; yet is unable to give the slightest evidence of his consciousness. It is certain that some persons have been buried alive while in this condition, yet such an occurrence is far more rare than excited imaginations are disposed to believe. The possibility of such an occurrence, however, makes it important to delay burial in any and every case where the apparent demise was sudden. Yet trance sometimes follows fever, as typhoid; and then it is sensible to wait for signs of decay, if the person have an unusually life-like appearance. Modern haste to get the body out of sight, is certainly to be condemned; and the longer the ordinary signs of death are delayed, the stronger is the suggestion that death may be only apparent. Of course all deceased bodies have, for a time, a certain "natural" look, usually including more or less color in the face; but this will not continue beyond a certain brief period, and then will be followed by distinct changes. The fact of death is usually plain enough, and to make question of it would be mere foolishness in most instances; yet trance cases occur, and in some persons are repeated; and when there is any ground for suspicion of this,

the following methods may be pursued to test the matter and to satisfy the mind perfectly:

Signs of Death.—Cessation of the heart's action is the one reliable sign of death. This ensuing after days of acute sickness is not likely to be mistaken. Yet mere loss of pulse may not prove that the heart has stopped, as the movement may be too slight to be felt though the heart is beating. In hibernating animals whose normal pulse is 80 or more to the minute, it can be retarded to 8 or 9 per minute while hibernating; and so may the heart of man during trance; and so slow and feeble a heart movement may be detected with great difficulty, or cannot be detected at all by the most skillful physician. Cases are recorded by eminent men where the heart beat could not possibly be detected for four hours, the person finally recovering; yet a total cessation of heart action for thirty minutes is not compatible with life. As it may yet be in slow motion though wholly undetected, the following measures will help to decide the possibility of circulation continuing in a suspected case: (1). Tie a soft cord tightly around a finger or the lobe of an ear; and if circulation exists the part beyond the constriction will gradually become red and then bluish-red, with a narrow white ring at the ligature. (2). Cut the flesh and apply a cupping glass, and blood is not likely to flow if the person is dead. (3). If the body is warm, clean bright needles thrust into the flesh will tarnish and rust in less than an hour if the person is living.

Cessation of breathing is another sign of death; but this may become so very slow and gentle as to be imperceptible for days and weeks. To help determine its possible continuance: (1). Hold a cold mirror close to the mouth and nose, and observe if it becomes moistened by the breath. (2). Suspend a light feather or similar body near the mouth, and note if it moves. (3). Stand a glass of water on the chest, and see if any movement of the chest causes the slightest ripple on its surface. The failure of all three of these tests for several hours, tried at intervals, is pretty strong presumptive evidence of death.

Tests may also be applied to the surface. (1). Heat a part with a lamp, or insert a needle into a part and heat that in a flame, till a blister is made. Remove the cuticle over the blister; and if the part beneath it is red and after a time a deep red line appears around the edge of the blister, the part has life; but if the blister contains water and air, and the skin beneath is dry and glazed, and no red line appears about the blister, that part is dead and the per-

son is probably dead. (2). Apply caustic potash to the skin; and in a dead person it produces no eschar or else turns the skin yellow and transparent; while in a living person it turns the part black or reddish brown.

After death, the heat of the body gradually and progressively diminishes, internally as well as externally. In rare cases it may rise for a time; but in from twelve to eighteen hours the internal temperature, as taken by a thermometer placed within the rectum, will have fallen from four to eight degrees below the normal, (which is about 98° F); and in from twenty-four to thirty-six hours will have fallen to about 75° F., which temperature is incompatible with life. Circumstances, as fleshiness, may retard the falling of the heat; but when the inner warmth continues above 90° for twenty-four hours after apparent death, such a person should be presumed to be still alive. All such observations should be made by a good thermometer placed deeply within the rectum, as surface examinations are of no value.

Within a short time after death the muscles become flaccid. This shows itself by the jaw dropping, the eyelids losing their elasticity, the joints becoming exceedingly flexible, and the limbs feeling peculiarly flabby. As a result of this non-elasticity and softness, the parts of the body in contact with the bed or other surface on which it may lie, become flattened. This state of relaxation begins almost immediately, in most instances lasts from three to five hours, and in some exceptional cases lasts twelve to eighteen hours. It is succeeded by a stage of muscular rigidity, in which the limbs and joints become much stiffened and the muscular flaccidity gives place to firmness. In whatever posture a limb or any part of the body may be when this rigidity sets in, the part remains fixed in that position. It usually begins as the body commences to get cold; but may appear without regard to such coldness. In the large majority of the dead, this stiffness of death (*rigor mortis*) is completed between the third and sixth hour after death,—beginning in the trunk, then the neck, proceeding to the upper extremities, and ending with the lower extremities.

From the time of its completion until it passes off is from eighteen to twenty-four hours; or from the first appearance until it ends may be from twenty-four to thirty-six hours in summer, and twelve hours more in winter. It passes off in the same order of its advancement. Various circumstances may greatly hasten the rigor mortis, actually stiffening the body in whatever position it

may be when overtaken by death and without any prior flaccidity; and circumstances sometimes cut short or prolong its duration; yet the hours named are the common averages.

So soon as the rigidity of death passes off, the muscles again become loose and flabby; and the processes of decay begin. It is possible for rigidity to pass off so slowly in some of the structures as to keep the lower extremities stiffened while the abdomen and face show signs of decay. This decay first shows itself in the greenish discoloration of the abdomen and the waxy swallowness of the face; and is accompanied by the peculiar odor of incipient putrefaction, and by the distension or bloating from the gases caused by decay.

Signs of extensive or general putrefaction occur in from two to seven days, according to the disease that caused death, the temperature of the weather and of the body, etc. Their appearance is conclusive evidence of death; and if there is any lingering suspicion whatever that the person is in a trance, the signs of general putrefaction should be waited for. It is indeed unpleasant to have a corpse in the house for days or weeks, and everybody in a state of agitation and suspense. But all that is nothing compared to the horror of possibly burying a human being alive. How long one should wait, is indeterminate. If a man can fast forty days, talking and taking exercise each day; it is certainly possible to live that long, or longer, in a state of profound trance when the suspension of activities makes no demands for food. Wait for full evidence of putrefaction, in any doubtful case; and meantime treat the body as if it were asleep and fully conscious of everything said and done, (as it may be), and neither allow the doctors to destroy life by electrical experiments or post-mortem follies, nor the undertaker to cause death by ice packing.

Treatment.—A person in a trance should have the extremities comfortably wrapped and warmth applied to them, and care taken to prevent bed-sores. Should there be intervals of half consciousness, advantage should be taken of them to give concentrated nourishment in fluid form; otherwise nourishment should be given by injection every six or eight hours. In profound cases it seems useless to attempt to arrest the condition. The most suitable measure for awakening the nervous system is to employ a magnetic current (by the "crank" machine), using a considerable power, but remembering that the little spark of life may be destroyed by too strong a current. Dr. Gowers tells of a case in which trance had

lasted for thirty-six hours, where a strong electric current to the arm quickly aroused the patient. In another of his cases, which had lasted for several months, this treatment for a long time had no influence, but afterwards the patient could by it be partially aroused for a short time; and then by repeating the application at the same hour every day, a tendency to periodical waking was established, the remissions became longer and more complete, and the attack was ultimately brought to an end.

Right here I may mention the well-known fact that the muscles will respond to a magneto-electric current after death,—the limbs being made to perform sundry motions and the very act of respiration being simulated. Such movements are by no means an evidence of life, but are due to a peculiar condition called “muscular irritability,” which is akin to the action of the muscles in rigor mortis. It is spontaneously manifested after death in several diseases, as in yellow fever and cholera. Such spontaneous muscular movements after evident death in cholera, are quite common,—the jaw rising and falling, an arm bending and straightening and sometimes the trunk from the waist upward rising in its coffin. Such occurrences are the origin of many sensational stories about such persons being buried alive, when the fact of death cannot reasonably be questioned. This muscular irritability may continue from three to six hours, or even longer. During this period, the magneto-electric current can be made to excite the muscular contractions; and such contractions, in case of suspected trance, are no proof of the existence of life nor of actual death.

Persons subject to trance are of strongly susceptible nervous temperament, and are probably leading a life that keeps the nerves highly wrought up and over-taxed. They should change their mode of life, cultivate mental and nervous self-restraint, and pursue the general invigorating course elsewhere directed for nervous exhaustion (Chap. xcvi).

CHAPTER CVII.

LOCKJAW. TETANUS.

LOCKJAW is a rigid and painful contraction of muscles, but by no means those of the jaws only. It always begins about the face, changing the expression greatly; and from thence extends to the jaws, neck, chest, back, abdomen, and more or less to the extremities. The jaws are tightly shut, and the patient cannot open them; and sometimes they are so rigidly set that they cannot be forced apart. The head cannot be turned or moved from side to side; swallowing becomes difficult; breathing is slow and labored, the walls of the chest expanding imperfectly; the abdomen is hard and the extremities are stiff. A few hours may extend this curious muscular rigidity from the jaws to all the other parts. Violent spasms of the muscles, lasting from a few seconds to five or ten minutes, come on at uncertain intervals, and cause excruciating suffering. These may bend the body backward, or draw the extremities in various positions, or fix the chest as if in a vice. The patient cannot talk, suffers greatly from hunger and thirst which he cannot alleviate, longs for sleep which he cannot obtain, and often is covered with perspiration during the spasms. Death from suffering and exhaustion usually occurs from the seventh to the eleventh day, but may take place in one or two days. If the patient survive beyond the twelfth day, the spasms gradually abate in frequency and severity, and in twenty-five days are likely to cease,—the muscles which have chiefly suffered remaining sore and stiff for several weeks.

Lockjaw commonly follows some injury or accident, or some surgical or dental operation, and usually within forty-eight hours. Persons who thus suffer have some peculiar but unknown susceptibility of the nervous system. No small number of cases, however, occur without direct injury as the provoking cause; and especially in tropical positions it appears frequently from no apparent cause other than sudden changes in temperature, yet is even then most likely to seize on persons who have somewhat recently undergone some surgical operation. Men are much more subject to it than women.

Treatment.—It is important to nourish these patients regularly. As they cannot open the jaws, milk may be fed in moderate quantities by slipping a finger between the jaws and the cheek,

and pouring the milk carefully, a little at a time, into the pouch thus formed; whence it will find its way behind the teeth to the throat. But nourishing injections must be depended on chiefly, barley water forming their basis and broth being added when the strength fails.

As to medication, any wound must be gently but thoroughly cleansed, and kept soft with poultices. Chloral has been depended on to procure sleep, and hasheesh to relieve the spasms; but both drugs are highly dangerous, cannot in any sense be relied on, and the sufferer is immeasurably better off without them than with them. Relaxation steadily maintained by injections of lobelia, is reliable and almost invariably effectual. An even teaspoonful of the powdered herb may be mixed with two or three ounces of thin barley water, and given every three hours. If this quantity does not check the spasms and loosen the muscles, double that amount may be used every two hours. Such medication must be kept up day and night; and at night, to aid in procuring sleep, an equal amount of powdered lady slipper should be added to each injection. If the strength begin to fail, put into each injection one-fourth of a teaspoonful of powdered blue cohosh. Simple as this course of treatment is, its efficiency might almost be called marvellous. The spasms that will resist the action of lobelia, or of lobelia seeds when a stronger preparation is necessary, are indeed rare.

CHAPTER CVIII.

HYDROPHOBIA. RABIES.

THIS fearful disease is never developed except from inoculation with the poison of a rabid animal, in most cases from dogs, in a few from cats, occasionally from foxes and wolves. A mild form of similar poisoning occurs from rats. It is almost invariably conveyed by the saliva of the animal in its bite, the poison not being known to be present in any other secretion; but it has been conveyed from a wound in dissecting a rabid animal, and also by the claws of a cat and a lick of the animal on an abrasion.

It is commonly believed that the bite of a dog will cause hydrophobia if the dog was well at the time and did not develop rabies for several weeks afterwards. But this is altogether impro-

able, though a dog may occasionally have the disease in so mild a form as to be imperfectly developed; and its bite at that time may communicate rabies, and the full signs of it in the beast not show themselves till later. For it is the plain fact that the period of incubation of this poison is long, in both men and animals; the average period in a person thus bitten being six or seven weeks from the bite till the symptoms of rabies appear, seldom less than four weeks, in a few cases twelve days, in almost half the instances three months, and in a number of cases as many as nine to twelve months. Cases have been recorded in which two, three, five, and even ten years have elapsed; but it is most probable that such were other forms of spasmodic nervous affections, and not hydrophobia at all.

Bites of a rabid animal are most sure to convey the poison when made on an uncovered part of the body, as the hand or face; for the teeth passing through clothing are so frequently cleansed from the saliva as often to be harmless. It thus happens that a great many persons bitten by animals known to be rabid are not poisoned; and on the average only one person in eleven of those bitten ever shows any signs of the disease. Children wearing thinner clothing and being more helpless than adults, are more sure to be bitten severely and to develop the malady. Human saliva can convey the disease to animals, but has never been known to do so to man; and no instance has ever been recorded in which the disease was contracted either by attendance during life or in examination after death.

Symptoms.—Whether the period of incubation be long or short, it has no symptoms. From the attention directed to the wound because of apprehension, it often feels painful; and the same anxiety causes more or less mental depression. Were it not for this dread, coupled with the idea that the malady is necessarily fatal under the common system of treatment, there would undoubtedly be fewer cases of hydrophobia; for every nervous disease is hastened and aggravated by strong mental alarm, and none of them more so than hydrophobia. Mere mental excitement has repeatedly given rise to symptoms so closely resembling rabies, that friends and physicians have determined it to be such when in fact the patient had not been bitten at all. Intense fear plays a prominent part in spasmodic sufferings of this and other kinds; and it is a fortunate fact that such cases quite surely recover, after causing much anxiety and inconvenience to themselves and to their friends.

Strong melancholy, general uncomfortableness, disturbed sleep, and bad feelings about the throat, are the early symptoms. In a short time the patient finds difficulty of swallowing, especially of swallowing fluids; which causes feelings of spasm in the throat, soon accompanied by short and hurried breathing, and by a "catching of breath" similar to that due to a sudden dash of cold water in the face. In a few hours these spasms become much worse, returning at brief intervals; and the breathing, during inspiration, is performed by strong efforts of the muscles about the upper part of the chest and the neck, causing the shoulders to be raised and the angles of the mouth to be drawn outward. Saliva becomes abundant, and so tenacious that it cannot be swallowed; so it hangs about the mouth and annoys the patient greatly. As the hours go by, the spasms about the throat and the muscles of respiration become more frequent and violent, and are brought on by trifling causes,—an attempt to drink, the sight or sound of water, a sudden current of air. The spasms extend from the throat and chest to the entire body, and are frightful in their violence and in their distortion of the face. At the same time the mind is usually disturbed, reason being lost during the spasms and perhaps continuously, a perfect frenzy seizing the sufferer, who throws himself violently about, attempts to bite and tear his attendants, hawks up the abundant saliva with sounds not unlike a dog's barking and ejects it with force. Such a paroxysm may last several minutes, and return at shorter and shorter intervals. Consciousness may return in some measure during the intervals, the patient begging his attendants to keep away from him lest he injure them when the paroxysm returns; but the mind may remain wholly confused during the lull in the spasms. Vomiting is common, and often appears early, a greenish-brown fluid being ejected.

Death from exhaustion usually ends these frightful scenes in three or four days. Sometimes the sufferer lives eight or ten days.

Treatment.—At the earliest possible moment, when bitten by a suspected animal, tie a ligature firmly above the wound. Then wash it thoroughly with warm water, and let it bleed as freely as it will. Then it should be cauterized, either with nitric acid (*aqua fortis*) or carbolic acid; or quite deeply with a red-hot iron. A free cutting away of the flesh about the bitten part is advisable, and then apply the cautery; or the cautery may be used first, and then the parts cut away. In so serious a matter, it is impossible to be too thorough and heroic at the start.

The treatment usually followed by those who wish the world to believe that they alone are "regular" and educated physicians, is almost invariably fatal. If any recover, it is accounted almost a miracle; or else is set down as not being true hydrophobia but simply a kind of hysterics,—as if death alone could prove a case to be actually one of rabies. This is too much in the line of the old test for witchcraft, which threw the suspected person in a river,—ability to swim proving her to be a witch, and she would be drowned, but drowning proving her to be innocent! The usual treatment is by opium, or morphine, or chloral, or worari poison, or other highly dangerous drug, in quantities large enough to kill any well and strong man. No wonder death is the almost inevitable result.

Recently, M. Pasteur, a Frenchman, has claimed that by propagating the poison of rabies from the spinal cord of one rabbit to another, it finally becomes so mild in character that its inoculation into the blood of man gives a gentle form of hydrophobia; and that this prevents the dangerous forms, and thus saves life. Persons bitten by a suspected animal are inoculated with this "cultured" virus; and if they subsequently do not have true hydrophobia, it is considered that the inoculation saved them. Such testimony is at best negative. As but one in eleven in all persons bitten have hydrophobia, and as vigorous preventive measures greatly reduce this proportion, and as quite a number of the bitten do take and die of rabies under Pasteur's method, the efficacy of that method remains a very doubtful problem.

But other physicians, having no faith whatever in the idea that poison in any form can ever be curative of disease, discard the whole treatment by opium, chloral, etc., and adopt entirely different methods. They relax the muscular system by the bountiful use of lobelia,—an agent which will relax any and every muscular tissue in the frame, and which exerts a really marvellous power in expelling every form of animal poison. A teaspoonful to a tablespoonful of the powdered lobelia herb may be given, in two or three ounces of thin starch water, by injection; the patient retaining it, and repeating every three hours, two hours, or hour, according to needs. The amount used will depend on the effects produced, and usually have to be very large. In some cases that have been treated successfully, and where this course was begun on the third or the fourth day of the spasms, four ounces of powdered lobelia seeds were given by injection in twelve hours, in addition to the

strength of six ounces by infusion in teaspoonful doses every few minutes as the patient could swallow. The object is, to bring the patient into that state of profound relaxation by lobelia which has been called "the alarm." Accomplish and maintain this, be the dose what it may. Half as much lady slipper may be used with each injection.

The treatment I have named has been effective in, so near as I can gather, forty-two cases. In most of these the patient has been encouraged to vomit once or twice in twenty-four hours; and also supplemented by the vapor bath. It does not answer the purposes of science to declare that those were not cases of hydrophobia. Those physicians who saw the cases declared they were true rabies, and most of them had been under the common treatment for two, three and four days, and given over to die, before other physicians undertook the treatment I have named. For physicians or others who did not see the cases, to come forward years afterwards and assert that they were not hydrophobia merely because a new method of treatment had saved them from death, is a bit of egotism as well as of ignorance. Novelty in treatment is no argument against anything that will save human life; and that which has already saved many, is what the people want when in danger.

In the majority of instances, hydrophobia is conveyed by a pet dog, the master or other member of the family being attacked. Rat terriers and spitz dogs appear most subject to rabies; but mastiffs and other large and docile beasts frequently have it. The causes of its development in the animal are unknown. It is commonly supposed to be due to the hot weather of summer; but as many or more mad dogs are found in January as in "dog days." Bitches are very seldom affected, and dogs that have been castrated still less frequently; whence it is supposed that sexual deprivation may have much influence in driving these beasts mad.

For several days before a dog exhibits rabies, he is liable to a train of suspicious symptoms. If these are closely watched, they will give ample ground for killing the animal in time to prevent his biting anybody; and the owner of a dog who would hesitate to take its life when its actions warrant fear, is a thoroughly objectionable member of society. Mr. Youatt, in his Treatise on Dogs, gives the following description of these premonitory symptoms:

"In the greater number of cases these are sullenness, fidgetiness, and continual shifting of position. For several consecutive hours perhaps he retreats to his basket or his bed. He shows no

disposition to bite, and he answers the call upon him laggardly. He is curled up, and his face is buried between his paws and his breast. At length he begins to be fidgety. He searches out new resting places, but very soon changes them for others. His countenance is clouded and suspicious. I have again and again seen the rabid dog start up, after a momentary quietude, with unmixed ferocity depicted on his countenance, and plunge with a savage howl to the end of his chain. At other times he would stop and watch the nails in the partition of the stable in which he was confined, and, fancying them to move, dart at them. Whether he is watching the motes that are floating in the air, or the insects that are annoying him, or the foes that he-fancies are threatening, one word recalls him in a moment. At his master's voice every object of terror disappears, and he crawls toward him with the usual peculiar expression of attachment. The dog rubs his ear against every projecting body; he scratches it might and main, and tumbles over and over while thus employed. Some dogs vomit once or twice in the early period of the disease; when this happens, they never return to the natural food of the dog, but are eager for everything that is filthy and horrible." The association of these symptoms is unmistakable.

A more systematized history of premonitory symptoms in the dog is given by the Council of Hygiene of Bordeaux, France, as follows:

"A short time, sometimes two days, after madness has seized a dog, it creates symptoms in the animal which it is indispensable to recognize.

"1. There are agitation and restlessness, and the dog turns himself continually in his kennel. If he be at liberty, he goes and comes, and seems to be seeking something; then he remains motionless, as if waiting; then starts, bites the air as if he would catch a fly, and dashes himself barking and howling against the wall. The voice of his master dissipates these hallucinations; the dog obeys, but slowly, with hesitation, as if with regret.

"2. He does not try to bite. He is gentle, even affectionate, and he eats and drinks; but gnaws his litter, the ends of curtains, the padding of cushions, carpets, etc.

"3. By the movement of his paws about the sides of his open mouth, one might think he was trying to free his throat of a bone.

"4. His voice undergoes such a change that it is impossible not to be struck by it.

"5. The dog begins to fight with other dogs. This is a decidedly characteristic sign, if the dog be generally peaceful.

"The three symptoms last mentioned indicate an advanced period of the disease, and that the dog may become dangerous *at any moment* if immediate measures are not taken. Kill him at once."

CHAPTER CIX.

DELIRIUM TREMENS.

DURING a prolonged debauch or immediately after, the nervous system that has so long been violated with liquor gives way to this peculiar form of suffering. It is marked by trembling of the whole frame, but mostly of the hands and arms with twitchings of the tendons in the wrists. The voice is trembling, weak and jerky, breathing is hurried, the patient is restless and wholly sleepless, the eyes are wide open and staring, and the mind is occupied with hallucinations full of terror. Horrible things are seen, and violent efforts made to get away from them; and the trembling patient keeps muttering, moving about, and suddenly making the most exhausting struggles to overcome or to escape his imagined foes. Any attempt to sleep multiplies these horrors, darkness increases them, and day and night he remains awake and struggles. A cold perspiration covers nearly the entire body in prolonged cases, vomitings are frequent, the face is pallid and shrunken, the pulse is small and very rapid. It is a fearful price to pay for the folly and sin of drunkenness; and a person may die in the first attack, or at any subsequent attack if he continue in his foolishness.

Treatment.—As commonly managed, two great follies are committed in this trembling delirium: (1st). Giving opium or morphine to obtain sleep. (2d). Allowing liquor so as to "taper off" from its use. It is true that a good long sleep ends the attack; but in this gravely exhausted state of the nerves the depression of a narcotic can but take them still farther away from the healthy state, and the amount required to force them into an unnatural sleep may be fatal. As to allowing small portions of liquor, it is almost incredible that any man claiming to have sense would advise such a thing; for what is more improbable than to cure so grave

a delirium by the very thing that caused it? Such a course will most certainly prolong the attack, and may greatly endanger life. Both these methods should firmly be avoided, no matter how great the persuasions of mistaken people; for the trouble is made worse and continued longer by them, and the nerves are left more diseased than they otherwise would be.

Keep the patient in a quiet room moderately well lighted, with two attendants to prevent his injuring himself. Give a strong infusion of four parts lady slipper, and one part each scullcap and blue cohosh; a tablespoonful or more every two hours or hour, according to the force of the symptoms. Larger doses are often required, but the disposition to vomit may compel the use of small quantities. Every three hours give the same articles by injection,—using a heaping teaspoonful of the mixed powders in three ounces of barley water, or adding a very strong infusion of them to an equal amount of starch water. I greatly prefer the infusion for use by the stomach; but the fluid extracts may be added to warm water and given in the same way. By vigorous perseverance with these agents, the most violent case will become soothed; and then gradually may be coaxed into brief snatches of sleep that will lengthen little by little till a full rest is obtained and the attack is broken. Scores of these unfortunates have come into my care, and I have always remedied their spell promptly by these measures. If the pulse get very small and feeble, as it does in two or three days, or earlier in old cases, add a small portion of golden seal to the infusion; or once in two hours give a powder of five grains golden seal, and a grain or less of cayenne pepper. For the purpose of sustaining the flagging strength of the patient, which is made the excuse of continuing liquors, these articles are immeasurably more valuable than any alcoholic drinks.

Sustain the patient by fluid and highly concentrated nourishment, well seasoned, given every three or four hours.

CHAPTER CX.

THE OPIUM HABIT.

IN every instance, probably without an exception, the habit of using opium for the sake of its narcotic intoxication comes from first using it under medical advice to ease pain. It is hard to endure suffering, but it is certain that opium never *cures* it. Sensibility is blunted by this drug, which is the type of all the narcotics; and along with this blunting comes various and mostly pleasant dreamy sensations. When the effect of the narcotic wears off, the sufferings return; and then another dose of narcotic is taken. While this process goes on, the life power, struggling against the disease and the narcosis—contending with two sources of debility instead of with one—overcomes the causes of the pain as best it can. As an outcome, the system is more enfeebled than it would have been had Nature contended with the disease alone. The nerves are highly sensitive from the disturbing effects upon them of the narcotic, and feel irritated and annoyed by the ordinary surroundings of life. In their jaded and fretted condition they seek relief and quiet. As the hour when opium had been taken returns, this nervous unrest increases, and opium is craved for its abatement. In too many instances the weakened nerves, and the weakened will, cannot or do not resist the desire thus set up. The dose of narcotic is repeated, till presently the system gets dependent on it; the demand for it becomes stronger and stronger till finally it gets imperious, and the wretched opium habit is established.

Persons of an emotional nature are most likely to fall into this habit. These are least likely to be willing or able to endure suffering in the first place; and are much less inclined to do so after the nervous system has been weakened. They crave the pleasant sensations and exhilaration caused by opium as the system first feels the narcotic influence. And they are the people who, having limited will power, soonest find their will dominated by the narcotic. For this loss of will becomes greater and greater under the daily use of any narcotic, till in a moderate time the victim is but a babe in mental capacity to resist the craving for the drug. When the hour for its use arrives, his power to contend against the appetite is gone. He feels that he needs it, that he must have it, that he will have it. The diseased state of the

nerves that the narcotic itself has produced, leaves him helpless and at its mercy,—each dose fastening the nervous disease more securely and leaving the moral power of the will more enfeebled. No strength of purpose is left, after a time, except the whimpering, childish, enslaved craving for the drug, and the uncontrollable demand to have it at any price or by any subterfuge.

One constant fact in this downward career of the opium user is the need of increasing the dose in order to get the desired effect. A very small amount was at first sufficient; but repeated blutings of nerve sensibility presently disable them from receiving the impressions of the drug as fully as before, and then the dose must be enlarged. With different rates of rapidity the dosage increases, till finally the blunted and stunned system demands, each time, a quantity that at the outset of this unfortunate career would have been fatal. This process of enlarging the dose is simply inevitable with every opium eater.

While this process of nerve degradation is going on, the whole body is suffering loss of health. Opium and morphine notably diminish the action of the bowels, producing constipation quickly, and increasing this till it becomes distressing. Digestion is correspondingly interfered with. The action of the liver is lessened, and presently is so greatly reduced that the whole system becomes charged with bile. Every one of the secreting and excreting organs is crippled in its office, or made nearly incapable of action, with the single exception of the skin; and at times this acts excessively and exhaustively until the unfortunate being is far on his way to destruction, when it also closes its function to a large degree. With a shrivelled and sallow skin, shrunken features, gaunt frame, constipated bowels, a torpid liver more or less asserting itself, impaired and reduced digestive powers, cold perspirations alternating with feverishness, unnatural sensitiveness to cold, an irritable and totally perverted state of mind, trembling and unsteady nerves, deficient and irregular sleep, marked loss of strength, indisposition for steady exertion, and loss of self-control, the opium user becomes a pitiable sufferer,—gradually and steadily going lower in the health scale till finally he is a physical and mental wreck. It is a fearful outcome of a mistaken medical theory that attempts to cure disease by narcotics that never had a shade of curative power in them.

It is no easy task to overcome this habit, even when it has but a moderate hold; but when it is an old one and deeply established,

it can be conquered only with great difficulty, and some would evidently die in the undertaking. As in treating delirium tremens, it is customary to attempt it by a system of "tapering off;" nearly every nostrum and course of management advertised for curing the opium habit, is based upon the use of opium in reduced doses, or the substitution of some equally dangerous narcotic for the opium. It is simply impossible to effect a cure in these ways. At once and firmly must the seductive drug be discontinued; as any other method is but trifling, and complete abstinence is the only hope for the victim. Such deprivation throws the system into great agitation and no inconsiderable suffering at times, and the patient will beg piteously for "just one more dose," and will resort to every subterfuge to obtain it. He cannot be depended on for one instant. Falsehood and death appear as nothing to him, if he can only get his narcotic portion. Even when he has voluntarily sought to be cured of the habit, his will is too feeble to sustain him in the attempt and he must have the closest watch and the firmest restraint put upon him. When this has been done, the nerves and heart are to be sustained in the struggle by the means I direct. Moderate cases require from two to four weeks treatment, and confirmed cases need some months.

Use a very strong infusion of two parts lady slipper, and one part each blue cohosh and dioscorea. A tablespoonful every two hours is a good plan; but some take to vomiting when the effects of their narcotic begin to wear off, and may not be able to take more than half a teaspoonful at a time, which should then be repeated every hour or oftener. Once in four hours give two grains scutellarin and half a grain hydrastis; and when the accustomed time for using the narcotic approaches, this may be given every two hours for three or four doses. The power of these agents to sustain the nervous system during the struggle, is really wonderful, as I have again and again had opportunity to observe. And in the promotion of natural sleep, which for days and days in succession appears impossible on discontinuing the narcotic, nothing equals these agents.

But the entire body is saturated with the drug, which must be eliminated. For this purpose the warm bath is the most effectual means. It may be used once, twice, four or more times a day, if necessary. Its temperature may reach 105° F. Under the terrible agitation and aching distresses of these patients, this bath is peculiarly soothing. Its usefulness in getting out the poison is remark-

able. About twenty years ago, a physician writing in *Harper's Magazine* told of using this bath at a temperature of 110° F., fifteen times a day, keeping the patients in it long enough each time to make them feel comfortable. Warm wet-sheet "packs" are admirable for the same purposes, the patient being kept in the pack one or two hours, and sustained by the above infusion; or by small portions of Composition tea containing one-tenth part of blue cohosh. Instances are recorded where, two weeks after the last dose of narcotic, the cloths from such a pack furnished a notable quantity of opium.

Feed the patient very light and soft foods, as the stomach is not capable of digesting any other. Keep the liver and bowels freely open, and the room quiet. Most families are unable to sustain the battle with a *confirmed* case of this kind, lacking the firmness of will to govern the patient through the prolonged restraint that will be required; on which account it is usually necessary to send these subjects to an institution, though all ordinary cases can be managed at home.

CHAPTER CXI.

ACUTE RHEUMATISM.

RHEUMATISM in its acute form, also called *Inflammatory Rheumatism*, occurs oftenest in persons under thirty, mostly in those between sixteen and twenty-eight; but it is by no means uncommon in young people, or in those quite beyond middle life. It is more or less distinctly hereditary, "running in families;" and in such may be developed readily, yet is very often severe where there is no hereditary taint. Men appear to suffer oftener than women, probably because of their out-door life; and persons of the bilious or sanguine-bilious temperament are most liable to it in the severest forms. Laborious out-door occupations, with much exposure to wet and cold, greatly favor its development. It is very common in some districts, as where dampness and sudden changes of temperature prevail; but in mild and equable climates is rare. High livers, using much meats and sugar, are good subjects for it; but it is equally common in those reduced by poverty, and sometimes a general debility of the system from any cause appears to favor

it. Persons inclined to it usually have an attack excited by exposure to cold and wet, or by getting chilled suddenly while in a perspiration. One who has suffered an attack, is afterwards liable to other but lighter attacks on slight provocation; and it frequently settles down into chronic rheumatism, from which the person may suffer in extremely varying degrees.

Symptoms.—It is common for an attack to be preceded by one or several days of chilliness, sense of discomfort, aches through the trunk and limbs, stiffness and light pains flying about the joints, perhaps a sore throat, and possibly a slight chill followed by some feverishness. In a short time the fever rises and becomes very high, with a full and frequent pulse that is not always firm, while the warm skin is bedewed with a sour sweat. The patient lies flat on his back, motionless because dreading to move, the face flushed, a little puffed, looking dirty or sallow, covered with perspiration. One or several of the joints are swollen, hot, red, very painful, and so remarkably tender that the least movement of any tendon causes sharp suffering and the patient dreads the slightest touch or even the jarring of the bed or the floor. There are thirst, a foul tongue, loss of appetite, hurried breathing, often a little cough, and great irritability of mind from the intense suffering and the inability to find any easy position. While most of the body is sore and stiff, the pain in the joints is very severe; and it shifts from joint to joint, those which are suffering to-day feeling nearly well to-morrow, when another series will begin to swell and suffer. In this way the pain travels about, sometimes returning to the joints first affected and repeating the rounds. Sleep is broken and uncertain, muscular twitchings often aggravating the pain and awaking the sufferer, and the muscles connected with the suffering joints aching and feeling powerless.

Attacks vary in duration as in severity. About nine days are occupied with the severer symptoms; but some cases—especially subsequent attacks—are not so severe or lasting; while a first attack occurring in middle or advanced life is more likely to continue from three to six or more weeks, and then to abate slowly. When the acute sufferings have subsided, recovery of strength is slow, the joints may remain more or less swollen and stiffened for a considerable time, by neglect or from constitution a sub-acute form of it may continue, and carelessness in exposure may suddenly start all the acute symptoms afresh. Chronic rheumatism often is engrafted on the acute form.

Death seldom results from acute rheumatism directly, though the great sufferings and profuse acid sweats are very exhausting. But it is liable to leave some of the joints enlarged and stiffened, and their muscles contracted so as to cause mal-position of the parts. It is also liable to involve the valves of the heart, and its covering and lining membrane, in inflammation; and this will cause acute heart suffering at the time and possibly end in death, but oftener lays the foundation for future severe and dangerous heart troubles. Rheumatism is liable also to involve other organs in inflammation; and thus puerperal, pleurisy, meningitis, etc., may at times accompany or follow an acute attack of this disease, and so may prolonged disease of the kidneys and St. Vitus' dance. On these accounts, as well as from its intense sufferings, acute rheumatism is an affliction much dreaded.

Treatment.—A rheumatic patient should have every advantage that can be gained from a strong nurse, a quiet room, a firm bed that can be reached from both sides, and arrangements to remove the evacuations without disturbing him. He should have a soft blanket above and below him to absorb the dripping perspirations; and a long flannel bed-gown, fastened with tapes down the front and along the arms so that any part of the body can be reached easily. The painful joints must then be wrapped in a pretty thick layer of cotton-batting, tied loosely with tapes above and below the joint; or kept in place by a somewhat snug bandage of flannel. Such wraps give the parts a soft resting place, and keep them evenly warm, thus contributing greatly to relief. Before putting on these wraps, wash the parts with tepid water containing a little soda; and the cotton should be removed carefully as often as the perspiration and the local appliances soil it.

Local applications are valuable, provided they relax the structures and favor exhalation from the surface. Stimulating liniments close the pores, and favor the shifting of the rheumatic pains to the trunk and possibly to the heart or the stomach. Such a translation would be dangerous, and perhaps fatal; hence anything used about the suffering joints must favor the escape of the sour perspiration, and on no account close the pores. Camphor and turpentine, so often used, are on these grounds objectionable; and especially have I found camphor diminish the amount of excretions, and render the parts more liable to permanent enlargement and stiffness. Such essential oils as hemlock and red cedar are open to the same objections. I have had the best results, both as to present comfort

and future safety, in repeatedly washing the joints with a strong infusion or tincture of black cohosh and lobelia, to which some essence of wintergreen may be added. The wraps may be opened and such an application repeated every two or three hours; and every twelve hours the parts bathed with warm water and soda.

It has been a common plan to put the hot joint in cold water, or to lave it freely with cold water,—by which the temperature will certainly be lowered, but future stiffness and disability ensured and the heart gravely jeopardized. I greatly dislike cold applications; but would prefer to wrap the whole part in cloths wrung from the very strong lobelia and cohosh infusion, and then by the aid of hot bricks or irons give them a sort of local vapor bath.

No specific treatment for acute rheumatism exists. It has become popular with one class of physicians to use the poisonous salicylic acid and salicylate of soda; but Dr. Bruce, one of the most candid of those who use them, says: "The principal drawback to the use of the salicylates is the fact that, whilst they cannot be continued for any length of time in sufficient doses to keep down the fever without the risk of producing poisonous symptoms, the rheumatism frequently returns as soon as their exhibition is stopped. Anæmia appears to be more marked, and convalescence more slow, after treatment with salicylates."

While the pulse is large and the fever high, I usually give five to ten grains of bicarbonate potassa, in two ounces of water, every six hours. Ten or fifteen grains of bicarbonate soda will answer the same purpose, modifying the acid sweats. When the sweats become distinctly less acid, or when the fever abates and the pulse is softer, give no more potassa or soda; and this commonly limits their use to about four days of the highest fever.

Fever in rheumatism cannot be treated with white root and other sweating articles, for the sweating is already too great. But it can be helped very much by getting free movements of the liver and bowels without any violent purgation. For this purpose, two grains of euonymin and half a grain of iridin every twelve or twenty-four hours are very suitable; or the Compound Leptandrin Pills may be used, or the syrup of butternut and wahoo. After these evacuations have once been started, they must be kept up steadily; for a clogged state of the liver and bowels is a decided disadvantage before and during a rheumatic attack. In like manner the kidneys should be kept in good action; for in my opinion the sluggish and changed action of them and of the liver, with

weakening of the stomach by wrong eating, lies at the foundation of all rheumatic attacks. Four parts queen-of-meadow and one part juniper, either in strong infusion or as fluid extracts, in suitable doses every four hours, will be appropriate for the kidneys.

In addition to these measures, give once an hour a tablespoonful of infusion of four parts lady slipper and one part black cohosh; which will be soothing to the pains and the whole nervous system. Wipe off the sweat as often as is comforting to the patient, handling him as little as possible. When, after four to six days, the pulse gets softer and the potassa is discontinued, one-half part of prickly ash bark should be added to this infusion; which now may be given every two hours. From this time onward, three to five grains of salicin may be given every four hours, in the above kidney preparation; and is of great use in sustaining the flagging powers of the heart and furnishing a desirable form of relief. If pain or distress attack the region of the heart, all haste must be made to apply over it every two or three hours one part of Stimulating Liniment with two parts Nervine Liniment, gently and somewhat persistently rubbing the region with the hand; as by these means the translation of rheumatism to the heart may be prevented.

Steady perseverance in these measures is requisite. Diet must be very light and of easy digestion; for the products of unassimilated and excessive foods are already burdening the system, and the digestive powers are too feeble for anything but the lightest articles. Meats are strictly to be forbidden till every rheumatic symptom has disappeared. Thirst is best relieved in the early stages by small effervescent draughts, or by adding lemon juice or vinegar to bicarbonate of soda dissolved in water. Large amounts of fluid are by no means advisable.

After the acute symptoms have subsided, the patient should keep his bed for several days, and especially if the heart have been troubled. It is often irksome to do this, but on all considerations of comfort and future safety it is decidedly advisable. Too early rising throws upon the heart and its valves an effort of exertion that may seriously over-tax them; and rest and quiet of body and mind for a number of days is the one true course. Walking is also to be attempted with great caution, lest sore and stiff joints follow; and the liability to recurring attacks on slight exposure, makes it very desirable to remain in-doors for a considerable time and keep limbs and body well protected by flannel clothing next to the skin.

Rheumatic patients are not always willing to follow this kind of advice, but they are apt to pay dearly for their disobedience. And it is so doubtful whether the rheumatic taint, once contracted, ever entirely leaves the system, that after an acute attack care must always be taken to avoid exposures to any considerable wet and cold, to protect the surface by wearing flannel garments next to the skin winter and summer, and by such restraints in eating as shall keep the system from being burdened with unassimilated food. Large quantities of meats and sugar are especially objectionable. So long as the liver and kidneys are kept unburdened from excesses in eating, and the stomach not weakened from surfeits, the chances of escaping future rheumatism are good.

CHAPTER CXII.

CHRONIC ARTICULAR RHEUMATISM.

CHRONIC rheumatism not unfrequently develops after an acute attack, but may arise quite independently of the acute. It appears to be peculiar to some constitutions, and "runs in families" as if a hereditary malady; its developing causes being the same as in the acute form. Its seat is in the joints, and more frequently the large rather than the small ones. It is characterized by a severe, wearying aching; with enlargement of the parts about the joints, and a sense of heaviness and uselessness of the limb. This pain is more or less relieved by rubbing and a cool atmosphere; is usually increased by slight warmth; commonly gets worse for a time after going to bed, and causes restlessness; is accompanied by stiffness, which causes increased pain for a time on motion but presently is relieved by moderate exercise. The natural lubricants of the joints diminish, causing them to feel dry and even to creak on motion. During the cold and wet months these symptoms are most severe, and are moderated in warm weather; they persist for weeks or months, indefinitely, presenting the most varied degrees. Rheumatic subjects feel the influences of electrical changes preceding a storm, suffering more sharply till the storm comes and then feeling relieved. Some careful observations show that a coming storm may be felt by some of these persons while yet at a distance ranging from five-hundred to eight-hundred miles.

The degrees of rheumatic development are so varied, that with some the trouble is little more than aching and stiffness about one or two of the larger joints, the person otherwise being hearty and living long; while in others the local and general disturbances are very great. In a more severe form, the pain returns as a series of sub-acute attacks, with redness and tenderness and swelling of the joints, the hands suffering mostly. Such attacks last for days, they follow closely one upon another, and gradually enlarge the finger joints and cause deformity. In the most severe forms, the large as well as the small joints gradually become deformed with permanent swelling until all are involved; they become almost or quite immovable and sometimes dislocated; the suffering is severe; and the attacks of aching and tenderness follow one another so rapidly from joint to joint, that the patient is perhaps never free from distressing pain, and he gradually becomes wasted, debilitated and anaemic. The changes about the joints in some of these cases are remarkable, bony material being deposited and the cartilages thickened till the parts are enlarged, contorted and "fixed" in endless varieties of contortion,—the adjacent muscles at the same time wasting and thus adding to the strangely deformed appearances. Fingers are turned toward the little finger, the wrist bones project backward and become immovable, the back of the elbow is enlarged and the joint bent, the arms are fastened so that they can be moved but a limited distance from the sides, the knees are enormously enlarged and possibly gaping from deposits within them, the lower extremities may be shortened and the deformed feet turned outwardly, the jaws in front of the ears enlarge, the head may be incapable of being turned or lifted, etc. Such persons finally become more or less helpless, unable to stand, perhaps compelled to sit or lie in one position for months or years together, crippled and bedridden, suffering somewhere all the time, feeling keenly any approaching change of the weather, appetite and digestion greatly impaired, the skin pale and extremities cold. Cases of this class are very rare but are terrible when they do occur, and the helpless sufferer may live a long life with a clear mind.

Treatment.—One would gladly know the actual cause of rheumatism, and thereby hope to find a key to its absolute cure; but the cause is speculative except in so far as we see unwise exposures developing it in some people, while the same exposures with other people do not lead to rheumatism but rather to pneumonia or consumption or some other malady. It is equally judicious to avoid

the exposures in every case by all people; and if rheumatism develop because of them or without them, the conditions found present must be treated regardless of the cause, though in this as in all diseases the circumstances that may provoke it must be avoided rigorously.

If one is in a district where sudden climatic changes and dampness develop much rheumatism, it is advisable for him to move from it to a more equable and less humid section of country if possible. If his particular location or house is unusually damp, he should remove from it. A wet cellar is often provocative of rheumatism. Such changes many times are followed by beneficial results of a decided character.

Local treatment consists largely in the use of liniments, which usually should be of somewhat stimulating and strongly nervine character, as the Nervine Liniment. Oil of origanum one ounce and oil of red cedar one drachm, in a pint of alcohol, make a good liniment. It is a good plan, usually, to wash the suffering joints well with hot water and soap, then apply the liniment with the hand and slowly "rub it in," (these joints are much comforted by gentle and prolonged hand-rubbing), and then rub in half an ounce to an ounce of goose oil, hen oil or linseed oil. Such oils are of decided benefit; and oil of origanum may be added to linseed oil instead of being mixed with alcohol. Goose oil is most penetrating; and angle-worm oil is good, though not elegant. Such appliances should be made two or more times a day; and the parts should be protected well with flannel or cotton-wool, and flannel worn next to the skin summer and winter. Liniments are almost endless in their variety; but such articles in them as opium, aconite (St. Jacob's Oil), chloroform, ether, and similar narcotizing drugs, are *very* objectionable and afford an extremely deceptive relief.

Constitutional treatment must aim at maintaining all the secreting organs in good condition, and keeping up the digestion; hence a good alterative syrup is commonly of advantage, with any fair tonic—as a little golden seal or columba—added to it. I like the Compound Stillingia Syrup for these purposes, the prickly ash being a valuable ingredient for rheumatic patients. Or a syrup may be made of four parts each American sarsaparilla and burdock root, and one part each poke berries (never the root) and prickly ash bark; and a large dose taken four times a day. Guaiacum is often used in such syrups; but it scarcely yields any of its properties to water, and if a tincture of it is added to a syrup the resin

floats and makes a bad preparation. Prickly ash I consider a better article. Keep the kidneys in good action by adding dwarf elder bark, one part, to the syrup last named; and maintain steady action of the liver by euonymin or the leptandrin pills. So important is good action of the liver, kidneys and stomach, that a useful preparation is made of two parts dwarf elder, and one part each wahoo and vervain, used before or after each meal. As the stomach always tires of any one medicine, it is advisable to change from one to another of these.

Vapor baths are often of wonderful value in chronic rheumatism, and especially if the skin is dry. One may be given at intervals of several days; and will materially soften and relax the joints at the time, besides carrying out a large amount of offensive materials. A good hot bath every second or third day answers a similar purpose; and so do the Hot Springs of Arkansas and of Bath county, Virginia, both of which are desirable places for such of these patients as can afford to visit them. In many patients, any of these several forms of warm bathing effects rapid changes. Electricity is useful many times, but is rather overrated.

The diet of these patients should be thoroughly nourishing while easy of digestion. Meats are needed in moderate quantities, but always of plain cookery; and a goodly share of fats must be incorporated with the foods, but gravies and soups are bad, and fried meats and fish are not nearly so good as boiled.

CHAPTER CXIII.

DISEASES OF THE SKIN.

Skin diseases are due to a variety of causes, all of which are more or less debilitating to the general system. Such derangements may proceed from direct poisoning, as in eating certain fish, or bad cheese, or stale ice-cream, or any article of food which is particularly indigestible. Or there may be indirect blood poisoning, coming under the term "impurities of the blood;" as from the failure of the liver which lies at the foundation of no small number of these eruptions, imperfect action of the kidneys, malaria, chronic constipation, etc. Faulty digestion, even when the diet is good, often induces these troubles; and irritations of the nervous system

will frequently do the same, as in the pimples that arise among young men and women during puberty. The same is true of general weakness of the assimilative organs and of nutrition, as in scrofulous persons; or a feeble parent may fail to nourish her infant fully, when trifling friction of the surface or over-feeding of the babe may readily produce some irritable skin disease. So constant are these facts, that whatever skin affection is present, it will be necessary to ascertain which particular organs are weak and irritated, and correct their derangement as an important part toward curing the trouble upon the surface.

The names of the skin diseases are many; but they can be put into a few general groups, and I shall pursue this simple plan in dealing with them. Erysipelas and the eruptive fevers (measles, etc.,) are skin diseases; but they are connected with fever and have been treated of elsewhere.

Eczema.—This is a type of the several inflammatory diseases of the skin. The skin tissue is weak and sensitive; and then is easily excited to eczematous inflammation by friction, cold water, warm water, stimulants, exposure to the sun, etc.; or by impaired digestion or nutrition, pregnancy, painful menstruation, teething, strong nervous disturbances, and many other influences. It is marked by redness, and by an intensely itching, burning pain. With the redness—which may vary from light pink to dull red—is some swelling; and the different subjects may show exceedingly variable degrees of puffiness from accumulations of acrid fluid under the skin, or pimples, or vesicles containing water or pus. If the fluid under the skin escape freely, it peels away the cuticle; if it escape slowly, it dries into unsightly and thick crusts which gradually peel up and are removed,—leaving a shining red surface; a succession of such crusts being in the different stages of moistness, drying, and peeling off on separate spots at the same time. Or the cuticle may peel off in thin layers without moistness; or crack deeply and peel slowly, as in the palms of the hands. In some of these forms it was formerly called *tetter*, and the moist forms were termed *salt rheum*. Itching is most severe in the dry kinds, and is relieved when a free escape of fluid occurs. It may appear on any part of the surface or at any time of life; and may run an acute course of a few months with successive crops of eruption, or continue in tormenting constancy for many years. It frequently recedes from the surface to the mucous membranes, causing bronchitis, or most annoying and burning distresses in the stomach,

bowels, bladder, etc. It may thus fluctuate between the outer and inner surfaces ; or may alternate with attacks of rheumatism, neuralgia, asthma, boils, piles, etc.

Eczema is not destructive of life ; but the itching and burning are always very annoying, and it may at times cause almost unbearable irritation of the nervous system. In treatment, digestion is to be improved by golden seal with scullcap, or other good tonics ; adding a portion of wahoo to act on the liver. If the stomach is very weak, the doses should be quite small, using such tonic three to five times a day. When the patient is more than usually sensitive and nervous, a large portion of lady slipper should be added to the tonic ; or be used with a small portion of ginger by infusion somewhat liberally through the day. The tonics used may be changed from time to time in chronic cases, and are best given by infusion ; and if a diuretic is needed, dwarf elder bark or juniper berries may be added. Local applications in the acute and highly irritable stages should always be soothing. I like to have the parts washed with weak borax water, tepid ; and then covered with zinc ointment. Much washing is certainly very undesirable ; for it increases the irritation, and removes the zinc film which is needed to protect the surface. A good course is to make an ointment of equal parts powdered oxide of zinc and golden seal, an even teaspoonful of the mixture thoroughly rubbed with one ounce or more of vaseline. Lard in ointments is often objectionable in inflamed eruptions. Sometimes it is soothing to the parts to dust them with the zinc and golden seal mixed with four to eight times their bulk of powdered starch. In chronic cases, and when stiff crusts are present, a more stimulating effect is given by adding a small portion of glycerine to the ointment. If the tissues are puffy and swollen from acrid fluid in them, this may be gotten to the surface by applying a compress of warm water and covering this closely with oiled silk or a thin rubber cloth,—wearing this water dressing at night and applying the ointment during the day. If there is too abundant a fluid discharge on the surface, use some powdered leaves of witchhazle in the ointment till it disappears. I am not partial to using any kind of soap in these irritable eruptions, but secure cleanliness as well as a soothing influence by borax water. Soothing ointments may be made with elder bark, bitter-sweet, or yellow dock. Local treatment is of no value unless a suitable tonic course has invigorated the system. Diet must be plain, nourishing, of easy digestion, and with very little fats.

Pruritus. *Prurigo.*—These represent great itching of the skin from nervous irritability rather than from inflammation. *Pruritus* is a perverted sensation without material evidences of skin disease; the itching chiefly affects the external parts of the mucous membranes where these merge into the skin, as at the anus and vulva, and is most severe at night. It may be provoked by rough clothing, often by minute animalcules (as in scabies, body lice, pin worms, etc.); by leucorrhea, ill conditions of the stomach or womb, piles, and not unfrequently by torpor of the liver. Such causes should be ascertained and removed by suitable treatment; extreme cleanliness must then be observed, and the parts bathed with an infusion of golden seal containing half a teaspoonful of borax and two teaspoons of glycerine to the pint. An ointment made of one part borax and four parts glycerine slowly beaten together till the borax has dissolved, and then rubbed with one part golden seal and ten parts lard, is a good application. Intense itching (pruritus) accompanies eczema, nettle rash and itch. *Prurigo* is a peculiarly burning pruritus mostly incident to elderly people with a harsh, dry and parchment-looking skin. It leads to fierce and incessant scraping of the skin with the finger nails, often tearing the surface and scratching off the heads of little papules. It is associated with deranged digestion and much nervous irritability; and made worse by flannel underclothing, the heat of the bed, etc. It is best managed by a steady course of bitter tonics, with wahoo for the liver; scullcap as a nervine tonic, and plenty of lady slipper by infusion for general irritability as in eczema; and then a generous diet for the better nourishment of the system. The parts should be washed with a warm infusion of lobelia and some golden seal, followed by vaseline; and a good vapor bath used occasionally.

Hives, Nettle Rash, Urticaria.—With some people, croup is called "hives"; with others, chicken-pox is so called. Americans usually apply the name to the sudden appearance of stinging itchiness with a light red surface, upon which rise round or irregular white prominences. These blotches are of varying sizes, last a few minutes or hours, disappear as suddenly as they came, and perhaps at once or soon after show themselves at another part, proving exceedingly troublesome. Sometimes a very slight feverishness accompanies it. It is best met by tonics to improve the stomach; adding wahoo, or especially berberry and a little blue flag, to maintain steady action of the liver. An occasional dose of Rochelle salts or magnesia may be used to evacuate the bowels. Frequently

there is an acid condition of the stomach, which it is well to relieve with a dose of lime water or of neutralizing cordial an hour or two after eating. Strong infusion of lobelia and lady slipper is a suitable wash; sometimes the addition of some golden seal is valuable; and a mixture of one part oxide of zinc and eight parts lime-water is an excellent application.

Itch, Scabies.—This is caused by a minute animalcule (*acarins*) burrowing under the cuticle. Its favorite site is between the fingers; but it may appear on any soft part of the body except the face. It causes scattered pustules with intense itching, and is readily contagious. Sulphur and cleanliness soon put an end to it. After a bath, apply to every part of the body an ointment made of an even tablespoonful of sulphur in half a teacupful of lard (less sulphur for children), and rub it in gently but thoroughly. Do this on retiring; and sleep with drawers, stockings and gloves on. In the morning take a thorough warm bath, and put on clean clothes. Repeat three nights in succession, and then once a week to only the hands. It is useless to continue this night after night for several weeks, which gets up a sulphur irritation mistaken for the itch itself. Three general applications, well made, will end it.

Ringworm.—Ringworm is troublesome to children and women, and is contagious to some degree, that of the scalp being quite communicable. On the face, neck and shoulders it appears in slightly raised patches nearly round, slowly enlarging, branny-looking, with a light-red line a little elevated around the edges. On the scalp the patches are about an inch in diameter, often several are present and run together somewhat, the surface is roughened, sometimes (but not always) the edges are red and have a number of minute pustules; and the hair in these patches loses color, dies and breaks off close to the scalp, leaving little stumps of hair standing up over the scurfy surface. In one variety on the scalp each hair bulb is swollen and exudes a thin fluid, and the parts feel soft and boggy, the hair falling out. Poor health usually favors this trouble in children, appetite and digestion being variable and poor. Good hygiene surroundings, plenty of out-door life, nourishing food, as much good butter and cream as will be digested, and the steady use of tonics—as the Nervine Tonic—are necessary. Wash the parts three times a day with an ounce each hyposulphite of soda and glycerine in half a pint of water. Every morning sop the part well with a weak borax water, and afterwards with water containing one-fourth part or less of vinegar. It is more difficult

to remove the disease from the scalp. Chip off the decaying hair, and then pull out the bulb with a pair of tweezers. After washing with borax water, thoroughly rub in an ointment of equal parts melted suet and tar. Do this night and morning, and have the patient wear a close silk cap. When the scalp becomes smooth, cease the tar ointment, and wash with an infusion of Peruvian bark. *Scalled (crusted) Head* covers considerable patches of the scalp with thick and dirty crusts, which often require poultices to soften them so they can be removed; after which they are to be treated as ringworm.

Pimples or Papules appear upon the skin under various circumstances, frequently during puberty and a few years after. They are principally situated about the face, but may appear upon the back, neck and arms. Sometimes they are red and conical elevations, of different sizes but seldom larger than half a pea, slightly inflamed, more unsightly than tender. At times these may gather a drop or two of pus after a few days, being somewhat inflamed, and then disappear and be followed by others. More frequently they do not suppurate. In some instances they are small and hard, with an accumulation of hard and white secretion in the gland, which can be squeezed out and is often supposed to be a worm; or with a black speck at the top from the lodgment of a speck of dirt in the mouth of the duct, and hence called "black heads" (*comedones*). Such persons should use somewhat freely the Compound Yellow Dock Syrup, or a similar alterative preparation, adding some golden seal or columba to give general tone. Wash the parts twice a day with a rather strong soap, and apply good friction; and follow with an ointment of half a teaspoonful of borax and a teaspoonful of powdered columba in two ounces of fresh lard with a teaspoonful of glycerine. In some very obstinate cases I have had excellent success with an ointment made as follows: Rub together half an ounce of starch and four ounces of glycerine, heat them in a saucer above the boiling point, stirring constantly, till a jelly is formed. When this jelly is cold, mix into it an even tablespoon of sulphur, and the size of a small bean of camphor wet with alcohol. I cannot commend this ointment too highly for these purposes.

Water Blisters, Shingles, Herpes, are terms applied to small blisters filled with fluid, which appear about the lips or in a belt half way around the body,—the parts being slightly inflamed and swollen. The fluid is at first transparent, but becomes yellowish,

and sometimes purplish from the presence of a little blood. One or several may appear at a time about the lips, lasting four or five days; and they often follow cold or overheating (*cold sores, fever sores,*) or appear at the end of a malarial attack, or follow a sudden spell of indigestion. On the body (*shingles*) they appear in groups, these groups following the line of the nerves from the spine around one side to the middle in front; and are accompanied by a burning, tingling sensation, sometimes by considerable neuralgia and some feverishness, having a regular course of from ten to twenty days. Restrict the diet, and give a dose of magnesia or Neutralizing Cordial to move the bowels freely. Spirits of camphor or tincture of marigold applied frequently to those on the lips will allay the stinging and often arrest their development. Those on the body may be dusted with flour or powdered starch, or washed with infusion of lobelia and a little golden seal, and otherwise treated as hives.

Boils.—These “Job’s comforters” are usually found on parts of the body most exposed to dirt or chafing, but may appear anywhere except on the palms and soles. Women are rarely troubled with them; they generally occur in the warm months; persons of stout habit or using a large meat diet are most subject to them; they often appear from vitiation of blood after exhaustive diseases, as small-pox or typhoid; are incident to some diseases of the kidneys, and frequently result from occupations that are peculiarly dirty, as wool-picking and rag-picking. One or several may appear, or there may be an unpleasantly long succession of them.

A boil begins with a red and itching pimple, usually showing a hair in the centre; it enlarges and hardens quickly, is dusky red, constantly tormenting with a stinging and then a throbbing pain. It breaks in about five days, discharging pus and at once becoming easier. A day or two later its “core” of decaying tissues escapes; and then it heals rapidly, leaves a purple and somewhat depressed scar. Sometimes there is no core, but a hard and painful pimple with diffused swelling, which subsides slowly and is called a “blind boil.” While very painful for such small things, boils cause no general disturbance; but when occurring in impure and exhausted states of the system, they cause severe and depressing symptoms. These may be prostration, low delirium, stupor, brown tongue, sordes on lips and teeth, vomiting, diarrhea, and other alarming typhoid symptoms; and recovery is very slow, or the case may prove fatal.

If the hair in the centre of the pimple is pulled out very early, the boil is likely to be stopped. If it proceed, cover it with a plaster of cobbler's wax spread on leather, or a plaster of gum galbanum; and let this remain, cutting a small hole in the centre when it gets ready to discharge. If pain and inflammation are considerable, better apply warm poultices; and it is best to use flaxseed mixed with lard as the poultice, or boiled starch and lard.

Hearty and coarse eaters should greatly moderate their diet and use regularly of vegetables and fruits. Persons who are feeble and the blood impoverished should have a generous diet of easy digestion. An alterative syrup should be used in large doses four times a day,—as Compound Syrup Yellow Dock; or a syrup made of two parts each yellow dock and burdock, and one part yellow parilla. For general feebleness add a small amount of golden seal to such a syrup, and a very little wahoo if the liver needs arousing. Full-blooded persons may take a sufficient dose of Rochelle salts every second or third day, to move the bowels. Warm baths, with plenty of soap and friction, are necessary to prevent a succession of boils; or the vapor bath once a week.

Styes are small boils coming on the edge of the eyelids. If the hair in the centre is plucked out early, the trouble is likely to be ended at once; otherwise nothing can be done but puncture them with a fine needle so soon as pus appears. Prevent their recurrence by the same course as in boils, and use an extremely weak preparation of golden seal for the eyes night and morning. Weakly children are most subject to styes, and need tonics with alteratives, and a healthy out-door life.

Carbuncle.—This is a local and rapid destruction of the tissues directly under the skin, including the skin itself, the whole coming away as a doughy and bloody mass of mortified substance. It occurs oftenest on the back or neck; and is not often seen till after middle life and usually in somewhat enfeebled persons. It begins as a painful and hard swelling, dusky red or purplish; enlarges, and soon breaks the skin into several small openings, from which a little pus-like and glutinous discharge escapes. In a few days these openings run together, making one large ragged opening, exposing the ash-grey and shiny mass of decaying flesh below. The parts feel an intensely burning pain and throbbing. Slowly the decaying mass comes away, the pain abates, and there is left a deep cavity with undermined edges which heals slowly and may leave a discolored scar. A carbuncle near the spine, on the head or over the

liver causes great disturbance of the system, with much prostration and perhaps vomiting, and may cause death by exhaustion or from extensive blood-poisoning.

Such persons must be well sustained by a good diet, perhaps by strong broths given in small quantities every few hours; the bowels kept open by equal parts fluid extracts butternut and neutralizing cordial; and the strength sustained by the spiced bitters or other firm tonic every three hours. Warm poultices of flaxseed with one-tenth part of powdered golden seal and twice as much cherry bark (or pond lily root), should be used, and renewed every six hours or oftener. It is best to make two cross incisions quite deeply into the mass, as soon as the little openings begin to show signs of enlarging; and after this to add a very little gum myrrh to the poultices, to prevent blood-poisoning. Some add considerable powdered charcoal for antiseptic purposes, and mix the poultices with thick yeast. At each renewal of the poultice, wash the part well with warm water, soap and borax (a teaspoonful to the pint); and then apply over the open surface and around the edges one part tincture of myrrh, two parts glycerine and four parts water. Such treatment should be continued till the sloughing mass comes away, when the cavity (after being cleansed) should be washed with a very strong infusion of golden seal containing four tablespoonsful of glycerine to the half pint. While the patient is very restless and nervous, he may take every hour or two a goodly portion of four parts lady slipper and one part dioscorea by warm infusion. During convalescence give the yellow dock syrup, with golden seal or scullcap as a tonic.

Corns come from shoes that are either too tight or too loose, but nearly always from the tight ones. Soft corns may be removed by the repeated application of lemon juice, or diluted acetic acid. Hard corns are more obstinate. I have generally removed them by using the Black Salve, spread thickly, with prolonged nightly bathing in warm water. Salicylic acid in an ointment is a most effectual application; and an excellent form of it is in the stores as a white salve called "Hanson's Magic Corn Salve." Another form of using salicylic acid is with cannabis indica and collodion in fluid form, called "Hindu Corn Remover."

Warts may be removed by a peculiar variety of measures, any one of which may be thoroughly effective in many cases and then fail in others. I have often used applications of castor oil successfully. Quite an opposite remedy is solution of iron sulphate, kept

by druggists; which dries a film that may be rubbed off, and repeated every day or two days till the wart is gone. A drop of strong acetic acid, or of nitric acid, once a day, is effective. Boys sometimes stick a few needles in a tough old wart, and hold the heads of the needles in a flame till the hard growth is charred,—which is not painful as a rule, for warts have no nerves. Onion juice is sometimes effective; and so is the juice of the common milkweed.

CHAPTER C'XIV.

SOME TROUBLES OF THE EYES.

In the first part of this volume (p. 199), directions were given for the hygienic care of the eyes. It is not possible for the people to manage the deep and intricate diseases of these important organs; but the more common ailments of the lids they can guide with success, and can save themselves immense trouble if they will faithfully preserve the eyes by the hygienic rules already given.

Acute inflammation of the eye-lids gives a tormenting sense of tenderness, itching and prickling. If from the presence of some *foreign substance*, it will oftener be beneath the upper than the lower lid. Lean the head well back, gently yet firmly lift the lid up and turn its edge outward, and search for the object. An exceedingly minute speck will cause a great amount of trouble, yet be so small as to be detected with difficulty and only by examining under the lid from different directions. Do not rub the eye, but keep it closed gently, and softly rub the *other* eye to divert and divide the suffering. Naturally the secretions will slowly carry down a remote object toward the edge of the lid, when it can be more easily removed. Fine dust may be gathered by putting a flax-seed under the outer angle of the lid, the mucilage of the softening seed entangling the particles and slowly carrying them to the inner corner, when the seed can be taken out. Sharp particles, as of iron or stone, may get imbedded in the tissues of the lid or the ball, and cannot be removed but by gentle pressure to dislodge them. The head of a bodkin, wet in the mouth, is a suitable instrument for this purpose. A soft silk or fine linen handkerchief, the corner twisted to a point and wet with the glutin-

nous spittle, is a proper means for removing most objects. A chronic inflammation of a low grade along the edges of the eyelids not unfrequently enlarges the hair-bulbs and causes their protrusion under the lid, or so inverts the lid as to cause some of the lashes to extend under it. These are called *wild hairs*, and cause protracted inflammation, often of severe grade. The hairs lose color, and can be detected only by sharp searching; when they must be pulled out from the roots, and then the chronic inflammation treated.

Simple Acute Inflammation, Ophthalmia, is quite common, as from foreign bodies; or slight blows, strong light, etc. It causes burning feelings, swelling, redness, and presently a mucous and watery discharge. It is met by a darkened room, rest, pledges upon the lids wet frequently with cold or lukewarm water, and probably a cathartic. As the degrees of such inflammation vary, so the time required to overcome it may vary from one to several days.

When such an attack is protracted, or frequently repeated, it becomes *chronic*, and may then cause decided trouble. Foreign substances of some class may be the cause of chronic inflammation, even when not suspected; and it is proper to search for them in the most thorough manner, that nothing of the kind may remain under the lids. Various washes are employed for this low grade of prolonged inflammation, nitrate of silver and sugar of lead solutions being common. I have no respect for such poisonous applications, which very often protract the trouble almost indefinitely and frequently do irreparable injury to the sight. Infinitely better eye-washes can be made from perfectly harmless agents. In general, these should be mildly astringent and tonic; so as to lessen the calibre of the dilated blood-vessels and give them strength. For this purpose, one may use a quite weak infusion of raspberry leaves, witchhazle leaves, tag alder bark, or table tea. It is an error to use such preparations strong; though occasionally an old case may demand extra strength in the infusion, the propriety of which can soon be judged by the patient himself. Distilled extract of witchhazle leaves, one form of which is known as Pond's Extract, may be much diluted and used; and has the advantage that it does not need to be made fresh each day, as the infusions do. My preference for such uses is one-half grain or less of hydrastis sulphate, and two to five grains of alum, in an ounce of rain water. Weak alum water alone is good.

Eye washes may be used twice or three times a day, rarely oftener. It is best to use a "dropper" for this purpose, and carefully introduce the fluid in the outer corner of the eye as the patient lies on his back. Every morning, and perhaps every evening also, the edges of the lids and the lids themselves should be carefully cleansed with water containing a very little borax. The water may be cold or tepid, as each person may find most agreeable to himself. If the discharges become purulent and gummy, it is sometimes advisable to put the face and eyes into a basin of water, and wink the eyes several times so as to wash away the discharge from under the lids. The bulk of two or three peas of table salt in a quart of water is sometimes valuable for this purpose. After this cleansing, the eye-wash is to be used. If the eye lids get sticky, let their edges then be lightly touched with cream, sweet oil, cold-cream ointment, or vaseline. In some obstinate chronic inflammations, and the more so when there is tenderness and the lids are rather puffy, in addition to these measures I have mixed one part of powdered golden seal into two parts of honey, making a stiff mass; and at night spread this thickly on a bit of close muslin and laid it on the upper lids. Its effects are most excellent. Golden seal may be made into an ointment with fresh lard stiffened with white wax, and used on the lids in the same way; but I prefer the mixture with honey. Of course all such tender eyes must be protected from the light by wearing smoked or blue glasses (not too deep in tone); and rest given to them by prolonged abstinence from reading, sewing, etc.

Purulent Inflammation is a chronic form of these troubles in which the discharge is mostly pus, the edges of the lids becoming inflamed and most of the eye-lashes lost. In severe cases it attacks the surface of the eye-ball, and may then cause ulceration ending in more or less blindness. The discharge is poisonous, and is easily communicable from one to another by the way of towels, wash-basins, handkerchiefs, etc. It is oftenest found in strongly scrofulous children, who become fearfully and painfully sensitive to even a mild light. Among children in orphan asylums it often becomes epidemic,—partly from contact and lack of cleanliness, but much more because of insufficient and unsuitable diet. In regions of fine dust it is common, as in Egypt and on other prairie lands. A protracted case of simple inflammation may become purulent. In addition to the utmost cleanliness, and the most rigid caution to prevent its being communicated to

others, such persons should have the system purified by active alterative syrups and brought up by good tonics. Compound yellow dock syrup, with golden seal or columba, may be alternated with compound stillingia syrup. Frequent bathing, and occasional vapor baths, are invaluable. Diet must be very nourishing yet plain; and adults must abstain from tobacco and all other uncleanliness. When these things are done, the local treatment above mentioned for chronic inflammation will be the right one, carried out vigorously.

Granular Eyelids follow some of the severe cases of chronic inflammation, the lining membrane of the lids being eroded by the disease and the discharge then preventing its being healed. The tenderness and half blindness caused by this condition are distressing, and by inefficient methods may continue for years. It is the common practice to cut these granules down by a rather strong solution of nitrate of silver, or with a stick of blue vitriol or other caustic. Such methods are very painful, prolong the trouble almost indefinitely, and I have abundant reason to know are wholly unnecessary. First purify and invigorate the system thoroughly by the course above directed for purulent inflammation, and thus prepare it to make granulations with sufficient strength to live. By this course the pus itself will be rendered less virulent, and thus be less corrosive and destructive to the granules as they are formed. Then, three times a day, wash under the lids gently with a lukewarm wash of ten grains of borax to the ounce of rain water. Raise the lid from the eye-ball to the fullest convenient extent, and use a small syringe to throw the wash in till the most remote points have been cleansed out thoroughly. In a few moments follow this with an eye-wash of ten grains alum to the ounce of water, putting three or four drops under the outer corner of the lid. Wait about ten minutes, and then put in two or three drops of a wash of one grain hydrastia to the ounce of water. In the absence of hydrastia, an infusion of the golden seal root will answer in any of these eye-washes; but hydrastia is better, and its value as a wash in any of these difficulties of the eyes is marvelous,—as some eminent oculists who have recently learned of it are aware, and as myself and others who have used it for thirty-five years and more have fully known. At night, lay on the lids a mixture of two parts golden seal and one part tulip poplar in honey, as mentioned above. When the case begins to mend, the strength of the washes may be reduced by one-third or one-half.

Cure is slow; but in hundreds of instances have I succeeded by these measures, and in no case failed.

Styes are small boils on the edges of the lids, and have been spoken of on page 582. A *Black Eye* is an unsightly object, due to settling of blood after a blow or other bruise. Many times it may be prevented by the prompt use of a moderately stimulating application to sustain the weakened blood-vessels. Of these, an infusion or tincture of marigold is one of the best, or a tincture of balsam pear, applied frequently. An excellent method in these and other bruises will be to add gum arabic to a moderately strong and warm infusion of cayenne, making a pretty stiff mucilage; to an ounce of which add five or ten drops of glycerine. Paint this upon the bruised parts with a brush or feather, and apply two or three coats in succession. Glycerine prevents too much stiffness, and the timely use of this mixture will generally prevent discoloration. A *Blood-shot* condition of the eye-ball may follow suddenly upon a slight blow or a violent fit of coughing,—the small blood-vessels dilating greatly, or actually breaking. Rest of the eye, and the use of a wash of alum, four grains to the ounce, will usually remove it in a few days; and then a weak wash of golden seal may be used.

CHAPTER CXV.

CARE OF THE EARS.

By the natural arrangement of the ear, it disposes of foreign substances by their ejection and thus is fashioned to protect itself. Yet solids from without may be forced into it and lodged against the drum, or the normal secretion (wax, cerumen) may accumulate in it by becoming too dry and hard. In the first case, tenderness and inflammation may be provoked; and in the latter case, confused hearing with thickening of the membranes and final deafness may result. In seeking to remove solids, a small ear syringe with a broadened nozzle should be used, the person sitting up and a stream of tepid water being thrown very gently upward into the cavity while a basin is held below to catch it as it escapes. In this way the substances are generally dislodged from the deeper positions; and can be lifted out with an ear spoon, or with a small

bit of wet linen on a bulbous bit of wood, when brought more outwardly. It is generally bad business to probe to the ear-drum with solid instruments; and it should not be done except when absolutely necessary, and then with the utmost caution. Many times the disease in the ear is started by the foolish habit of picking at them deeply with a pin or a metal instrument to get out the wax, or scouring at them with the twirled point of a towel wet in soap-suds. If the wax harden, it usually causes deficiency of hearing gradually increasing, without any other especial disturbance. Each night put into the ear two or three drops of equal parts glycerine and water; and when the wax softens and begins to appear at the orifice, remove it gently.

Eczema, in chronic form, may trouble the entire canal of the ear. Women in advanced life are most subject to it. In addition to the ordinary irritation of this malady, it thickens the membranes till the passage is nearly closed, thus obstructing the escape of the secretion and leading to deafness. The local applications suitable to eczema are to be used, and the secretion regularly removed with care.

Extreme *dryness* of the passage from insufficient secretion may be overcome by daily syringing with a weak infusion of lobelia; and, when dry after the washing, a drop or two of glycerine and water. Glycerine is much better than oil, but should always be diluted with at least its own bulk of water. *Excessive discharge* occasionally appears, becoming watery and offensive, often due to roughness and strong soap in washing the ears. For this condition, syringe the ear with lukewarm water containing five to ten grains of borax to the ounce; and then drop in two or three drops tincture of marigold while the ear is yet wet. A small layer of purified cotton, picked loose, may be used to absorb excessive discharges,—wearing it in the outer cavity but never pressing it inwardly, changing it as needed and applying vaseline to the outer parts.

Ulcers, causing protracted discharges of pus, may follow acute inflammation and abcess, or appear as sequelæ of measles or other eruptive disease. They are extremely troublesome, heal slowly, and if at all neglected are likely to end in more or less deafness. Wash out the ear twice a day with weak borax water, as above; follow with a weak infusion of golden seal, and then a couple of drops tincture of marigold. If the discharge cease suddenly, the marigold is to be omitted, for it may harden and dry up the pus

too quickly. Then attend to the general health thoroughly, using such an alterative as the compound yellow dock syrup; adding a little golden seal, columba or other tonic to improve appetite and digestion; giving a good diet, but avoiding heavy foods; and providing the best hygiene and out-door life.

Acute inflammation of the ear passage usually is due to exposure to cold drafts, and mostly occurs in those who have been in declining health for some time. The pain is severe and the passage much swollen, and an abscess is likely to form in a few days. In some cases the progress is rather slow, and the abscess may not form for a week or more. As the deeper parts cannot be reached with the usual applications, the best that can be done is to put two or three drops of lobelia oil and glycerine into the ear while the patient lies with that side upward; and when this has passed in, cover the ear with a pretty warm flaxseed poultice in a bag, mixing in it some camomile flowers or spearmint, and then lying the suffering ear down on the poultice so the vapor from the poultice shall rise into it. I much prefer this to the common practice of putting a roasted onion into the ear. Oil of lobelia around the outside of the ear and in front of it, is good; and oil of mullein flowers is admirable, but unfortunately is rarely to be had. An abscess should be opened as early as possible, both to limit suffering and to save future danger to the ear-drum and the bones. Begin the use of alteratives early and vigorously, as above mentioned for ulcers.

CHAPTER CXVI.

BURNS AND SCALDS.

LIGHT injuries by heat cause inflammation and pain without blistering. Many simple plans for relief may be adopted. My own preference is for a liberal application of butter, which gives almost immediate ease; and then the part may be wrapped in dressings of the same. Another excellent application is cooking soda (bicarbonate of soda); which should be put on bountifully and slightly moistened. Relief from it is very prompt. Lime-water mixed with an equal bulk of linseed oil, or olive oil, or goose grease, or even of lard, forms a soapy liquid that is ex-

cellent, though not so readily procurable as butter or the soda. Or the part may be covered with flour, which is excellent. Chalk and vinegar, mixed to a thick cream, make a valuable application. Whichever method is adopted, better follow it preseveringly and thoroughly rather than shift about from one method to another. It is a common custom to plunge the part at once into cold water, which is soothing, but has to be continued a long time; and in extensive burns and scalds, or with sensitive persons whose nerves suffer a shock from the accident, cold applications may cause a chill that is not advisable. Warm water, if procured quickly, is much better. If the injury is severe enough to cause blisters, the fluid should be let out of these by a small puncture at the lowest part and the loose cuticle then pressed gently down upon the parts beneath. Subsequent dressings may be of butter, vaseline, or other oily material.

Deep injuries by heat are always serious accidents; and so are injuries that extend over a large surface, even if not deep. The shock to the nervous system is severe. No pain may be felt, the nervous system being so overwhelmed that it cannot suffer and the person be likely to die in a few hours. Otherwise the suffering will be very great, and may exhaust the patient in two or three days; or if he pass through this, profuse suppuration may exhaust him in one or two weeks. Pus discharges, of an offensive character, usually begin in forty-eight hours, with fever; and parts thoroughly destroyed soon begin to slough off, and complete this process in about two weeks. It is common for internal organs to be congested in consequence of such burns; hence there may be pneumonia, pleurisy, inflamed bowels with diarrhea, etc. Such troubles may be prolonged, especially diarrhea; and cause serious exhaustion after the burn itself has begun to do well.

In these extensive heat injuries, remove the clothing quickly but very carefully. Cut it away piecemeal, if necessary, rather than run a chance of tearing off any of the skin or flesh. Let the room be warm, so that the air shall not favor the chill to which the patient is already inclined by his injury. While the clothing is being removed, let materials for dressing be prepared in plenty; and sustain the injured one with essence of ginger in water, a tea-spoonful every few minutes; or a warm tea of ginger, or of composition, or of cinnamon and pepper,—any one of which is immeasurably better for rallying and sustaining the patient than the whisky or brandy so generally given.

The mixture of lime water with linseed or other oil, as above mentioned, is one of the most useful dressings. I believe fresh butter to be equally good; and even in these extensive injuries, the cooking soda made pasty with water is admirable, and a very little borax added to the water used with this soda will be good. All dressings should be spread bountifully upon rather broad strips of old linen or worn table-cloth, so that they can be removed for future dressings without exposing too much raw surface; should always be warmed a little, and never be put on cold; and should be spread over every part that is damaged. At the best, it causes much suffering to make these first dressings; hence the utmost tenderness must be exercised in applying them, and it is best to give a strong infusion of lady slipper with some ginger in small doses every few minutes during the process, if the patient is nervous.

First dressings should not be removed for some days, or until the offensive smell or general feelings of discomfort show their removal to be necessary. Then they should be taken off carefully, a portion of the strips at a time; and any cleansing needed must be done tenderly, a weak and tepid borax water being best for this purpose, and a spraying or atomizing apparatus preferable to the gentlest washing. After removing these first dressings, the parts will need attention every day. The linseed preparation may be continued till the discharge of pus becomes free and the surface looks cleanly, and then it may be exchanged for more salve-like articles. I am partial to a dressing of vaseline into each ounce of which have been rubbed thirty grains of powdered oxide of zinc. If there is an offensive smell to the discharges, twenty grains of powdered borax may be added to each ounce of this; and after a time, ten grains golden seal. I have had great satisfaction, while the sore was irritable and the discharge of pus considerable, in using a dressing made as follows: Rub together one ounce of powdered starch and seven ounces of glycerine, and then heat in a saucer with constant stirring till a jelly is formed; and while this is yet warm mix into it half an ounce of powdered borax. Spread on soft old linen, this makes a fine application and quite soothing and cleansing. If the sore is highly irritable after the first week, to each ounce of this may be added ten grains of iodol (not iodoform); or else an even teaspoonful of the finest powder of wild cherry bark. If the discharge is so abundant as to be exhausting, cherry bark or a less quantity of witchhazel added to any dressing

will gradually reduce it; and the infusion of witchhazle, or the distilled water of this medicine, may then be used in washing the sore. An old burn or scald, not disposed to heal, after being washed each day should be wet with a very strong infusion of golden seal containing some glycerine; and then dressed with vaseline containing some golden seal, or with the Black Salve spread very thinly on old linen,—which is a most admirable article for old burns.

Deep injuries of this kind always contract the parts in healing, and are likely to produce pitiful deformities. During and for some time after the healing process, fingers and toes should be kept well apart by strips saturated with oil or the dressing; if about the neck, the head should be kept to the opposite side or the chin lifted high, and so of other parts as may be needed to prevent such deformities. When the best has been done, some deformity may remain.

As accidents of this kind are tardy in healing, the condition of the patient must be kept good. For the first few days, he must have small quantities of ginger with a much larger amount of lady slipper, by infusion every hour or two; have hot bottles about him to sustain the bodily warmth; and be given very light nourishment every three or four hours. Afterwards, the Nervine Tonic may be given three or four times a day to sustain strength; and if the discharges become considerable, he will finally need Spiced Bitters, with perhaps one or two grains of salicin, every three or four hours, and a generous and well-seasoned diet.

CHAPTER CXVII.

COLD. FROST BITES. CHIBLAINS.

It is customary to speak of “seasonable weather” as being most conducive to health. In the winter season we can have only winter weather; and the low temperature of this season is a most prolific cause of disease and of an alarming increase in the death-rate. Any considerable fall of the thermometer below a moderate average for the cold months, is quickly followed by a largely increased mortality,—chiefly from the bronchitis, pneumonia, pleurisy, and other maladies directly caused by chilling the surface; but also by depression of the circulation and of nerve energy from cold lowering vital resistance to other diseases and causing internal

congestions. Mortality from cold in winter weather is greatest among the feeble; hence the death-rate increases largely among children, and among those over forty in a somewhat definite ratio with the advance of years. I cannot too strenuously insist, as I have elsewhere, that the dangers from a cold atmosphere must be provided against in every judicious way; and that the first evidences of a chilled surface should never be neglected nor trifled with, but removed promptly and energetically. Many a serious illness might be averted, many a desolation in the home be spared, by quickly bathing the feet in warm water, and drinking freely of hot ginger or composition tea or lemonade, after exposure, even though the person felt no cold beyond a light chilliness on the surface. The very slightness of that chilliness is often deceptive; and every consideration of safety calls for its prompt removal.

When a part of the surface is frozen, it becomes white, stiff, and without sensibility. When it again thaws, it swells and redden with the returning rush of blood, becomes painful and inflamed, and the skin presently peels off. Prolonged exposure to severe cold more or less rapidly reduces the resistive powers of the system. Shiverings, puckering, paleness and coldness of the skin, livid spots, and muscular flutterings mark the general yielding of the frame. A part may freeze deeply; or a very considerable portion may succumb to the cold and terminate in death. In this event, delicate persons may die in the state of shock just described and the extent of actual freezing be limited. Others pass into a fainting condition and die. But in most there follow upon the shock stiffness and irregular contraction of the muscles; the body bends and shrinks, the limbs are half bent, a feeling of weight and numbness ensues, the steps are slow and faltering, everything becomes strange and confused, and there is an irresistible desire to lie down and sleep.

A deeply frozen part, when thawed out, is so weakened in its integrity and powers as to be liable to gangrenous decay; and it will require the utmost care to save it, whether it be a small part or a depressed chilling of the general frame. The chief point is to restore the warmth and circulation *gradually*; for any sudden or rapid elevation of temperature will leave the structures too feeble to support life, and local decay or death will ensue. A frost-bitten person must not be brought into a warm room, but be kept in one that is cold and dry where warmth can be introduced gradually. The frozen parts should at first be rubbed with snow or with ice-

cold water, using the hand, and rubbing very gently but continuously. Rough handling or hard friction will be sure to cause damage. If the general system is suffering, place the patient on his back, carefully remove the clothing and wrap him in blankets, and proceed to rub him. At the same time give small portions of hot coffee, tea, broth or soup, or weak ginger or composition infusion, to sustain the heart and elevate the circulation. When the skin begins to get somewhat pliant, let the dry hand be used in continuous friction till the deeper parts are softened from their rigidity. Meantime let the room be warmed gradually to about 60° F. The time occupied in restoring such a person will depend on the extent of the freezing,—too much haste endangering life by a too sudden reaction, while delay in action may take away the chance of recovery. For a considerable time after a severe injury of this kind, the patient must rest, and have good nourishment and tonics.

A part that has been frozen remains purplish, tender, itching and swollen for some time; and heat or cold quickly intensifies the tenderness into a severe burning sensation. These feelings are usually called *chilblain*, the term being also applied to similar sensations about the feet when these may not have been frosted at all but only severely chilled. Such sufferings are very annoying, and the tender parts are easily frosted. Mildly stimulating applications are most suitable, such as a very weak infusion of red pepper in vinegar, the liniment made of equal parts ammonia and sweet oil, the Nervine Liniment or balsam pear tincture. An application of this kind may be made night and morning, and the parts then covered with zinc ointment and protected with cotton flannel.

If a frozen part become gangrenous, it is to be managed as other gangrenes and the patient's strength well sustained.

CHAPTER CXVIII.

ABSCESS. SUPPURATION. FELON.

AN abscess or "gathering" is an accumulation of pus, or purulent material, in any tissue or organ, because of the decay and liquefaction of the structures. It may follow the introduction of a foreign substance, a blow or other injury, the absorption of a poison, or some form of disease in the organ itself,—as in abscess

of the liver or the kidneys. In size it may vary from a trifling spot—as from a small splinter in the flesh—to the aggregation of several ounces or pints of fluid. The process of forming pus is called *suppuration*, and is generally most rapid in soft tissues and slower in the dense ones.

Abscesses are oftenest *acute* in their career, occupying from four to six days in gathering pus. They are inflamed, swollen, hard and painful; and an abscess of even moderate size is likely to cause some feverishness, while large acute abscesses, or quite small ones in positions that cause severe pain, will provoke much disturbance of the whole system. When pus begins to form some shivering will be felt, at times light, again sharp, very seldom unnoticed; and then the pain in the part will soon become throbbing. The pus, enclosed in a sort of hard sac that the inflammation builds up around it, gradually finds its way to escape either upon the surface or into some inner cavity,—as when abscess of the liver escapes by the bowel, or bursts into the cavity of the abdomen and causes death. Coming toward the surface, the centre of the swelling becomes more elevated or “pointing,” and soon feels softened. In a little while it will burst at this softening place, the pus will escape freely and immediate relief be enjoyed. Simple pus is cream-colored and rather thick; but it may be greenish-yellow, dark green, thin, watery and sometimes offensive, according to position and other circumstances. The cavity thus left proceeds to fill up with flesh and to heal, unless some foreign substance remain in it to prevent healing.

In unhealthy persons, and when the abscess is connected with poisoning (as in erysipelas), a circumscribed wall may not be built up around the pus; also in some positions, as in the palm of the hand among the numerous tendons there. The pus will then float off among the tissues, giving the part a mushy feeling, and probably causing extensive destruction of tissues and finally accumulating at some distant spot. In abscess at the hip joint, the pus may gravitate along the vessels and muscles, and be found at or below the knee. Some abscesses are *chronic*, coming up slowly and without inflammation, leading to large accumulations of pus with little disturbance beyond a general sense of exhaustion, and continuing for weeks before detection. These have little disposition to “point;” but finally may break, or the pus may slowly be absorbed and the abscess disappear. Poor health and great loss of strength accompany chronic abscesses.

An acute abscess should be kept quite soft with flaxseed poultices containing some lobelia; which may prevent suppuration, or will limit its extent and hasten outward pointing if pus have formed. Move the bowels fully, and give a light diet. When shivering and throbbing pain occur, mark the central point of tenderness and open the abscess there so soon as the least softening of the wall can be detected. A narrow and sharp knife is to be used for this, and the opening should be made directly inward and not very large. It is much better to do this than await the spontaneous opening of the sac; for the pain it causes is very much less than is apprehended, many hours of distressing suffering are saved, and the healing process is more rapid than when the abscess is left to burst of itself. Relief is almost instantaneous. Gently press around the base of the wall so as to get out all the pus; twirl a narrow strip of old linen into a sort of tube and insert into the opening to act as a sort of drain; and dress it with a small poultice of flaxseed or bread and milk to keep it soft and to catch the discharge. It is well to remove the poultice, carefully press out the pus, and re-dress it once in twelve or eight hours. If it should look dusky or the discharge become watery, mix into the flaxseed one-fourth its weight of powdered cherry bark and a little golden seal. When the discharge has about ceased, discontinue poultices and dress with vaseline or any healing ointment. A large abscess may prove quite a drain upon the strength; and then the patient must be sustained by a generous diet including substantial soups, and the Spiced Bitters or other good tonic every three or four hours.

When the pus of an abscess has no wall around it, free cross incisions must be made as soon as a mushy feeling is detected so as to let out the fluid; and the parts should be covered with flaxseed, charcoal, golden seal or pond lily, and a very little gum myrrh in poultice, and washed with compound tincture myrrh and glycerine at each dressing until good action has been started. At the same time the patient should drink liberally of composition tea, and take Spiced Bitters every three hours. In chronic abscess, let the general strength be kept up by tonics and a moderate use of composition; and seek to have the pus absorbed by fomentations of bruised mullein leaves. If general disturbance and a hurried pulse appear, discontinue mullein and draw off the pus at the lowest point by inserting a grooved needle or an exceedingly narrow knife.

"*Catarrh*" is a name often given to an abscess in the palm of the hand, generally occurring as a result of a bruise. Because of the numerous tendons and thick skin, the pus has difficulty in escaping and is liable to burrow through to the back of the hand. Carry the hand in a sling with the palm always turned downward, to prevent this accident; poultice the palm liberally; and open through the palm early and freely after throbbing pain has indicated the presence of pus. Early opening and steady after poulticing are necessary to save the hand from crippling. Such an abscess recovers slowly.

Felon, Whitlow, is an abscess near the end of the finger, beginning at a small point of exceedingly pungent suffering as if a needle were thrust in the flesh. A severely painful thing it is, even when the pus is but under the skin and outward of the bone covering; but when the pus is beneath that thin and tough membrane that covers the bone, the suffering is terrible, the pain and inflammation extend up the hand and arm, and the finger bone may be destroyed if the two or three drops of pus in this little abscess are not let out early. It is usually impossible to arrest a felon, though sometimes I have done so by a poultice of flour paste full of lobelia seeds and kept soft by adding glycerine. Opening as soon as possible after pus has formed, or about twenty-four hours after the throbbing pain has begun, is the only right way. This abscess will not "point;" and intense suffering with the probable loss of the finger end will result from delay. Cut completely down to the bone, with a narrow blade, at the point of sharpest tenderness. If but one or two drops of pus escape, the work has been done effectually. Poultice then as in other acute abscess.

CHAPTER CXIX.

ULCERATION. ULCERS. SORES.

ANY open sore upon the skin or the mucous membrane is an ulcer. All ulcers have a more or less abundant discharge upon their surface, called *Pus*. If the sore is in a condition favorable to healing, this pus is cream-like in color and consistence and is called *healthy pus*; but if the sore is not inclined to heal the pus is thin, watery, bloody, acrid, and otherwise *unhealthy* or *ichorous*. Sores

fill up evenly with the surrounding surface and heal over by the formation of layer upon layer of minute *granules*; and any condition or influence that alters the natural character of the granules, either as to their size or number, also changes the character of the discharge and delays or totally arrests the healing process. An ulcer may be caused by a wound, bruise, burn, or other outward injury; or by boils, carbuncles, abscess, cancer, or other destruction of tissue from within. Some ulcers are in a great measure caused by enlarged veins, or prolonged by such a condition of the veins; and in all such cases it is necessary to bandage the limb all the time so as to hold the veins in a reduced condition, else even the simplest ulcer is not likely to heal but to get worse. Occasionally a woman will have ulcers appear or enlarge at each menstrual period, discharging more or less blood; such cases being called *vicarious ulcerations*, being often accompanied by enlarged veins, and demanding rest and thorough toning of the frame, and steady but mild promotion of the monthly function. Their differing conditions cause ulcers to be divided into different classes, requiring varied treatment, as follows:

I. *Simple Healing Ulcer*.—This is the type of a *healthy* ulcer. The surface is covered with small, light-red, sensitive granulations; the pus is cream-like, and moderate in amount; the edges of the sore are soft, light-red or pink, and ready to extend an extremely thin pellicle over the granular surface so soon as this comes near the level of the surrounding tissues. In managing this, only simple measures are necessary. Rest is a first requisite, and is even more important in the other classes of ulcers. Once in twenty-four hours, twice if the discharge is considerable, wash it with luke-warm water containing a little soap or borax,—irrigating the surface to remove the pus but never rubbing it. After cleansing, lay over it a piece of lint, or of well-worn linen table cloth, dipped in a weak borax water and lightly covered with oil or vaseline. Over this may be placed a piece of oiled silk a little larger than the piece of lint, and then the whole gently bandaged to keep all in place. The lint catches the discharges; and is infinitely better for this purpose than poultices, for poultices long continued will relax all the parts, including the granules, and thus lead a simple ulcer to become a weak one. If the discharge become very profuse, the dressing of starch and glycerine directed for burns (p. 592) will be advisable; and a moderate infusion of cherry bark, or a weak one of witchhazel leaves, may be used once or twice a day with soap

in washing the sore, till the discharge decidedly lessens. Give a generous diet of easy digestion, and keep the bowels open. In delicate persons or extensive ulcers, mild tonics should be used steadily.

II. *Weak Ulcer*.—In this the granules look pale and flabby, then have a watery or gelatinous appearance, and finally rise above the surrounding surface,—when the soft mass is called “proud flesh.” The edges of the sore look natural, but are overlapped by the pale granulations; the discharge is thin and watery. Prolonged use of soft poultices may lead to this condition in a simple ulcer; or it may result from general debility and impoverished blood. Reduce the “proud flesh” by daily, or semi-daily, applications of powdered burnt alum, which is sufficient for this purpose in a short time without using any caustics as is so commonly done. Make this application after washing the sore with cherry or witchhazle infusion and soap; and then sprinkle the whole surface with finely powdered cherry bark, or add a little golden seal to this in an obstinate case, or use four parts pond-lily and one part golden seal. Then dress with lint as directed for the simple ulcer. Bring up the tone of the system by spiced bitters or other strong tonic.

III. *Indolent or Callous Ulcer*.—This is a chronic class of cases, and constitutes most of what are called “old sores.” The surface of the sore is sunk below the level of the surrounding parts, has no granulations, is dusky-red or ashy-grey, and often looks glazed; the edges are raised, hard or callous, almost gristly at times, irregular, and may be purplish or grey in color; the discharge is but little, and is thin or watery; and the parts surrounding the sore are somewhat raised, hardened, and dusky in color. Such an ulcer may continue for months or years, at times and especially at night paining severely, suffering and an ill-condition of the sore increasing at once by being too much on the feet or indulging in drink, and the general condition of the system being bad. Tobacco using favors the prolonged existence of these sores; and with some persons they come from a simple ulcer, and are continued indefinitely, by personal uncleanliness.

It is a somewhat popular belief that an old sore should not be healed, lest thereby the body be poisoned and death ensue. Such a sore becomes, in time, a sort of outlet for impurities; and if the outlet should be closed suddenly by any treatment with salves, it will indeed check the escape of such impurities until the sore (covered with a weak film of unsound tissue) break out afresh.

This is true of any ulcer forced to quick healing by local appliances and without thorough improvement of the whole system. But a continuing sore is itself an evidence of an ill condition of the whole body; and the sooner that condition is changed so that the sore can be filled up with healthy granules and healed from the bottom soundly, the better for the person and for his prospects of life.

Personal cleanliness and change from an unhealthy occupation (p. 119) are imperative first steps to a cure. Tepid bathing with plenty of soap and friction two or three times a week, total abstinence from tobacco and alcoholics, a full diet of the easiest digestion, and rest of the limb as fully as possible (old sores are mostly about the ankles), are equally imperative, and must be observed rigidly if a cure is expected. And then the glandular system must be put into thorough action by the steady use of compound syrup stillingia, alternated every month with compound yellow dock syrup; and golden seal or the spiced bitters at meals, to procure full digestion. Constipation, even in moderate degree, must be overcome by wahoo in the alterative as well as by a steady use of fruits in the diet. It may take six months to two years properly to cure such a case; and in addition to these vigorous constitutional measures, some cases refuse obstinately to mend till a thoroughly stimulating emetic followed by a vapor bath has vigorously stirred up the system once a week or two weeks.

In the local treatment, the hardness of the edges and surrounding parts is first to be gotten rid of while the constitutional invigoration is going on. Draw the edges of the sore toward each other, and strap them so with strips of the common adhesive plaster,—crossing the strips in different directions, but leaving small openings at the lower parts for the escape of discharges. All the parts should be strapped evenly and tightly several inches in all directions from the edges of the sore. Remove the straps for a new application every forty-eight hours. At each removal, wash the sore and the adjacent parts with an infusion of golden seal, soap and borax,—to which a few grains of cayenne pepper may be added while the parts remain insensitive; as these sores need considerable stimulation until the local circulation and local sensibilities have been well aroused, after which the cayenne must be lessened or omitted. After the washing, wet the sore and the parts around with a strong infusion of golden seal containing one-fourth part compound tincture of myrrh,—increasing or diminish-

ing the amount of this tincture according as more or less stimulating effect is desired. Then re-apply the straps, remembering that they require to be drawn pretty tightly for the sake of the pressure. Continue steadily in the use of these local and constitutional measures till the system is thoroughly purified and invigorated. Granulations will then soon appear and fill up the sore; when the local dressings are to be the same as for simple ulcer, renewing the strapping and stimulating washes if granulation show any signs of failing or the surrounding parts become dusky again. Healing salves and ointments may, after a time, hasten the covering over of the sore; but if this covering is of a leaden or dusky color, it is not sound and will pretty surely break down after a time. It is not healthy tissue; and it is far better not to use such ointments, and to take more time in the course directed so as to get sound healing. Sometimes an indolent ulcer becomes inflamed, as below.

IV. *Inflamed Ulcer*.—Any form of ulcer may become inflamed during its progress; but the indolent ulcer is most liable to do so from immoderate walking or other use of the limb, other local irritation of any kind, the free use of strong drink, or derangement of the general health. Suddenly the surface of the sore is covered with a greenish-gray substance that sloughs off; the edges are red, swollen, and turned outwardly with swelling; the discharge becomes free, offensive, and irritating to surrounding parts; and a throbbing pain sets in. Whenever such conditions arise, the limb must have perfect rest; and poultices of flaxseed or elm with lobelia till the inflammation subsides and the suffering is relieved. Afterwards follow the course of treatment appropriate to the special ulcer.

V. *Scrofulous Ulcer*.—Few persons are afflicted with this form of sore. It is situated about and above the ankles, where it commences as a bluish, noduled swelling of the skin and the parts under it; and which gradually breaks into a number of small openings with thin and puffy edges, discharging a thin and acrid water, and which communicate under the surface. They are not deep, enlarge slowly and generally run together, sometimes are annoyed with stinging pains, at other times are not painful, commonly cause weakness of the limb and more or less swelling of a somewhat dropsical character for some distance around. Such ulcers appear on persons of a scrofulous constitution in poor health, and may continue for long periods of time.

The general health is to be improved as directed for indolent ulcers. Upon the ulcer itself, mild stimulation is generally needed until the soft portions of tissue come away (under which process the sore is for the time deepened and enlarged) and solid granules appear. I am partial to applying to them, about once or twice a week, a poultice of boiled carrots well mashed, the stimulating action of which may be moderated by adding some flaxseed. A poultice of this kind seldom needs to be continued more than eight hours, and then should be changed. Between the carrot poultices, and after they are no longer necessary, I rely mainly upon the tulip poplar bark, which is peculiarly valuable in allaying pain and advancing the granules. If fresh bark can be obtained, it may be bruised, moistened with a little warm water, and applied directly,—the whole being then covered with oiled lint. If the powder is used, the entire sore may be covered thickly with it, and vaseline or other ointment on lint then applied. After this, wrap the limb snugly with a bandage, and change the application every twelve hours. This course may be continued till the granules fill the sore to a level with the surface, using a little powdered cherry bark if the discharge become too free or the granules look large and pale. Then dress with any healing ointment. In the absence of tulip poplar, scrofulous ulcers may be covered with powder of pond lily at the dressings. Strapping is not advisable, as for indolent ulcers; but the support given by a moderately snug bandage is very necessary.

VI. *Bed Sores.*—Persons who are compelled to lie on the bed for a long time, are liable to have ulcers formed as a result of the continued pressure upon the buttocks, hips, heel, calves, elbows and other points. Feebleness, old age, poor nourishment and paralytic conditions favor such sores; so does bad nursing, which allows urine or other discharges to remain on the parts, or permits a blanket next to the body to become moist with sweat, etc. Once formed, bed-sores heal with great difficulty so long as the patient is confined to the bed; or may not heal at all, but add the exhaustion of their own discharge to the malady already existing. Old people, and those partially paralyzed, are most liable to suffer extensive and intractable ulcers of this kind.

Bed-sores generally begin with the patient complaining that the sheet is creased, or that bits of bread or salt in the bed hurt him, when nothing of the kind exists; at the same time pricking, numbing sensations are felt in the parts though no change can be

noticed; yet in the paralyzed no sensations will be complained of though ulceration from pressure be far advanced. Presently the skin of the pressed parts roughens, looks pink, and feels tender on pressure if not paralyzed. The color deepens to red or purple, or even to black; the pain, except in the paralyzed, becomes considerable, and afterwards ceases from destruction of the local nerves; and finally the decaying part dies and a foul discharge runs from it. This local death is a form of mortification, the parts around being a dull red, and the edges undermined. Decay may be superficial and the sore shallow; or the destruction may be deep, the slough be cast off very slowly, and the very bones at last be exposed in some cases.

It is important not to wait for signs of bed-sore, but to keep the parts exposed to pressure in the best possible condition. Wash them regularly with soap and warm water, dry thoroughly, rub them gently but till dry with a piece of cotton wet with whisky or cologne water,—repeating this three or four times at each dressing,—and change the pressure from the parts by soft pads or air cushions. After the use of the spirit and friction to harden the skin, apply a very small quantity of oxide of zinc ointment, and with the hand rub it in carefully until all greasy feeling has disappeared. Keep under the patient a draw-sheet, dusting a little oxide of zinc on it where the patient is to lie; and change this sheet just as soon as it becomes wet from pus, blood, sweat, or dribbling urine. Pads and cushions must be prepared in the same way; and no feathers or blankets must be used about the bed. In severe cases, a water-bed becomes necessary. The endangered parts must be dressed two or three times a day. By such care in nursing, bed-sores are usually prevented; but in the old, semi-paralyzed and impoverished, it may be impossible to prevent them.

If the skin change color and roughen, the zinc ointment may be spread on it, and covered with lint. If the skin break, cleanse the sore with soap and borax in warm water; and cover it with the soap plaster of the drug stores spread on linen. After the washing, it does well to wet it with spirits of camphor diluted with one-third water before applying the plaster; and the parts for some distance around should be wetted with tincture of myrrh diluted with two or more times its bulk of water. If the sore deepen, apply this myrrh preparation over it at each dressing, in preference to the camphor. If it become foul, a good plan will to be to cut a piece of lint, or a few thicknesses of old linen, of the exact size

of the sore; soak this in tincture of myrrh or tincture of balsam pear and put within the edges of the sore; cover with a bit of oiled silk, and over this put several layers of old linen with a hole cut in the centre of the size of the sore. Picked oakum is a good article to use over such sores, absorbing the discharges besides acting as an antiseptic. Fix all the dressings by strips of adhesive plaster, and not by bandages. Poultices are not to be used on bed-sores; except at times a poultice of flaxseed and charcoal, and a little compound tincture of myrrh in moistening it, may be applied for a few hours in hurrying away a slough of grey or black substance.

VII. *Gangrene. Mortification.*—These forms of decay may occur in the course of some ulcers; or may result from carbuncles, frost-bites, burns, wounds, and various injuries. They are different degrees of tissue destruction,—mortification being the more complete and causing the death of all the tissues of a part, while gangrene destroys the softer structures and for a time may leave the more dense ones undestroyed. Gangrene is the beginning of death in a part, as when a bed-sore first appears; and unless arrested in its progress it ends in mortification or the death of all that part, the dead tissues being called a *slough*. In gangrene, the parts, if previously inflamed, lose the redness, heat and tension of inflammation, become soft and pasty, and the color changes to a dusky or brownish purple, and finally turns black and gets offensive. Usually there are severe pain, restlessness, want of sleep, loss of appetite, a foul tongue, a feeble and hurried pulse, and considerable prostration. These disturbances are partly from the shock of alarm in the nervous system, partly from the poisoning of the blood by the dying substances being absorbed. When the dead part gets black, it slowly separates from the other tissues and comes off or may be removed, and an ulcerating surface is seen. If the health have not been too much reduced, granules appear and the healing process begins; but in prostrated and feeble persons, this may be delayed and then advance very slowly, or in other cases may not be set up at all and leave the mortification to extend fatally.

Gangrene may develop without inflammation, as in some elderly and thin people; where a red-brown spot on a toe slowly becomes cold, livid and black; extends to other toes, and to the foot or even along the leg; may shrivel or may swell, and is exceedingly painful, exhausting, inclined to relapses, and likely to

end in death. When following severe injuries, and the more so in warm weather, it may spread along the extremities toward the trunk rapidly, the absorption of the poison bearing the system down quickly. A moderate injury may thus terminate fatally when the previous state of the patient was bad.

At the first signs of gangrene, the patient must be put in the best hygienic surroundings with plenty of fresh air, and have the best of easily digested food well seasoned. His circulation must be sustained by the use of warm composition tea (Thomson's formula) given every hour in full quantities;—and to this may be added ten to twenty drops compound tincture myrrh. A fourth part of blue cohosh added to this is admirable for the restlessness. Perhaps no measures are so powerful as these in fortifying the system against gangrene. Upon the parts themselves apply a poultice of flaxseed and charcoal, with a quite small portion of powdered myrrh. In wetting such a poultice, it will be an advantage to add one or more tablespoonfuls of glycerine containing as much oil of origanum as this will "cut." Boiled carrots may be alternated occasionally with the flaxseed for the poultices. Such appliances must be renewed every six or four hours; and at each dressing after washing the parts with soap and borax in warm water, they should be wet thoroughly with compound tincture of myrrh and glycerine in a strong infusion of golden seal. As the suffering incident to some of these cases is the suffering of destruction, these means for arresting destruction are far more effective in relieving suffering than any narcotic whatever; for in proportion as a narcotic stupefies it depresses the system, and thus reduces the general powers of resistance, extends the gangrene, and endangers life. Times and times again have I saved limbs from amputation by other surgeons, by pursuing the course here directed,—not stinting the use of myrrh and its compound tincture. The cayenne pepper alone, inwardly and outwardly, is a potent arrestor of gangrene. After the slough has separated, the ulcer must be treated according to the class to which it belongs; and tonics to sustain the patient must be used every two or three hours from the beginning to the end of treatment.

CHAPTER CXX.

DROWNING. ARTIFICIAL RESPIRATION.

WHEN a drowned person is taken from the water, he must be treated on the spot and without loss of time in taking him to a house. Time is precious, and every instant of it valuable; so not a second should be wasted in removal, unless the weather is very cold and its chill may so depress the nervous system as to interfere with recovery. Cut away all tight clothing down to the waist quickly; protect the surface and preserve the internal heat, even in warm weather, by wraps of coats, blankets, and any other coverings procurable. Keep off bystanders, so he may have free chance for air and not be suffocated to death by them. Three or four stout persons can do all that is needed.

First, wipe away everything from the mouth and nostrils.

Second, turn the patient upon his face with one arm brought under his forehead, and a bundle of clothing under the lower part of the chest and the stomach, and press heavily on the spine over



FIG. I.

the site of this bundle for *one-quarter of a minute*,—or while slowly counting *twenty*. (Fig. I.) In this position the mouth opens and may be wiped out quickly; the tongue falls forward, and should be seized by an assistant with a handkerchief; and fluids will be forced out. On no account should the patient be lifted to his feet or even to a sitting posture; as such a position causes the water to sink to the bottom of the lungs, and might strangle a patient who was gasping for breath.

Third, turn the patient quickly upon his back at the end of this time, with the cushion of clothing under his shoulders and lower part of his chest, the head falling back a little, the assistant



FIG. 2.

drawing the tongue forward and to one side of the mouth. Take a position at his head, grasp his arms just above the elbows, and draw them steadily but firmly above his head. (Fig. 2.) Keep them thus stretched upward while slowly counting *one, two, three*. This position lifts the ribs and permits the ingress of air, which may be heard rushing into the lungs for the space of nearly two seconds.

Fourth, bend the patient's elbows, turn the arms downward



FIG. 3.

upon the sides of his chest quickly, and firmly press against the sides of the chest while slowly counting *one, two, three, four*,—or two seconds. (Fig. 3.) This movement forces the air out of the

lungs, when the position of the arms above the head is to be resumed, and these movements continued alternately.

These two movements imitate the act of breathing, and constitute *artificial respiration*. They are to be made at the rate of about ten a minute for the first few minutes; and then increased to fifteen a minute, which closely imitates natural breathing. These movements should be continued steadily, without hurry and without an instant's remission. Nor should they cease because signs of life do not return soon. It is not uncommon for them to prove successful at the end of an hour, or of two hours; and some cases are on record in which no signs of returning life were seen till the third or even the fourth hour of unremitting artificial respiration, the attendants then being rewarded with the recovery of the patient. Nevertheless when a person has been completely under water for fully *five minutes*, there is no probability of his recovery. Exceptions exist; but they are so exceedingly rare as to be peculiarly exceptional. Time seems very long to those looking on while one struggles for life in the water; but reports of persons being restored to life after having been under water half an hour or more from "the last time he went down," are mistakes. The more mucus there is about the mouth, the less favorable the chances for air re-entering the lungs.

While artificial respiration is being carried on, the assistants should *gently* rub the surface all the time if possible. When a few gasping efforts at breathing are made, let the rubbing at once become more brisk and firm, and be made *upward* on the extremities so as to help the return of the blood toward the heart. Use the hands, or if possible warm flannels, in making this friction. Now bring more artificial warmth to the surface by hot irons or bottles, hot flannels, etc.,—especially making such applications at the feet, between the thighs, and under the arm-pits. So soon as there is sufficient consciousness to swallow, give a teaspoonful of warm water with a little ginger essence, or any other prompt stimulus except an alcoholic.

Suffocation, Asphyxia.—Drowning is one form of suffocation; but in this paragraph I especially allude to the suffocation caused by poisonous gases which deprive the lungs of enough air to live on. Such gases are found in vaults, and sometimes in old wells, causing dangerous or fatal suffocation to those descending into them; may escape into a room from a sheet-iron or other thin metal stove (pp. 35, 46); from stoppage in the stove-pipe or chim-

ney, or tightly-closed draughts in a base-burning stove, causing the products of combustion to escape into the room ; from leakages in gas pipes, or from a gaslight being blown out instead of being turned off, etc.

A person thus suffocated must be removed to the open air immediately, or to a room in which the air is fresh. Quickly loosen all clothing about the neck, chest and waist. Place the patient on his back, and proceed at once to practice artificial respiration as above directed for drowning. At the same time slap the chest briskly with the wet end of a towel ; and repeat this somewhat rapidly, first on one side and then on the other, for a couple of minutes, then cease a minute and repeat. Such quick slaps help to startle the nerves into sudden respiratory action ; as do quick dashes of a little cold water in the face, alternated with similar dashes of warm water. Diluted ammonia or smelling-salts held moderately near the nostrils for a few seconds at a time, aid in the same manner. All these measures may be used while artificial respiration is being carried on. Such persons may return rather slowly to full consciousness, even when breathing has been re-established ; and may be sluggish and confused for some time after all danger has passed. If the heart has ceased to beat in an accident of this class, no efforts will restore life.

CHAPTER CXXI.

INJURIES AND EMERGENCIES.

SHOCK is felt through the nervous system in accidents, fright, etc.; and is more severe in delicate and elderly people than in the strong and middle aged. An injury near a vital part gives a more serious shock than the same degree of harm at a more remote place ; but severe injury to any part may be serious in the shock it causes. By way of the nervous system, the heart, general circulation and breathing will be more or less involved in disturbance.

Slight shocks, in a few minutes or later, cause paleness, weakness, faintness or actual fainting, more or less fluttering at the heart and coldness of the extremities. Such feelings generally last but a few minutes, but may be prolonged in delicate persons. Lie the patient flat on his back, loosen all clothing from the throat to

the waist, give plenty of air, apply smelling-salts or hartshorn somewhat near the nose. If he is conscious, give any mild stimulus, as essence of ginger in water, or a very little tincture cayenne, or an infusion of ginger or composition. Give a teaspoonful or two every few minutes till relieved. If a meal has been eaten recently, vomiting may occur after a time, which is an advantage.

In severe shocks, consciousness is partially lost, the surface is quite cold and pale, slight shiverings pass over the body, the pulse is small and hurried, the breathing is hurried and usually sighing, and the countenance has an anxious expression. From such symptoms the patient rallies more slowly than in lighter cases. Such a shock may become much more severe in degree, marking the condition usually called *collapse*. In such cases the prostration of the nervous system and circulation is great. Unconsciousness may be complete, the countenance is pale and sunken, the eyeballs roll upward, the eye-lids are partly open, pulse small and weak or perhaps lost, breathing slow and more or less moaning, the whole body pale and covered with cold and clammy moisture, and sometimes the urine and faeces pass involuntarily. Such conditions may be protracted, the patient may faint repeatedly when he begins to rally, and the danger is considerable. When rallied from, there will renewed slight shiverings, vomitings, returning force to the pulse and color to the lips and face, and presently a full circulation and natural breathing. This restored condition is called the *reaction*, and is to be hastened vigorously. If reaction is delayed for hours and hiccough set in, a fatal termination is to be expected.

Loosen the clothing; supply fresh air; put hot articles at the feet, inside the thighs, under the arm-pits; apply strong stimulants on the front of the wrists and along the sides of the neck, as the Stimulating Liniment, tincture of cayenne, or similar powerful agents; cover suitably with blankets; rub the extremities upward steadily. If the patient can swallow, give small quantities every few minutes of the stimulants directed for slight shock, using them rather strong; but for no consideration add injury to nerves and brain by dosing the helpless man with liquor. If he cannot swallow, lose no time in giving an injection of an even teaspoonful of powdered ginger, or half that of composition, or tincture of cayenne, or any other strong stimulant. Use tepid water in the injection, if it is at hand. Repeat such an injection in half an hour, if needed. Rallying should be made as promptly as possible;

then if vomiting become severe, put a strong stimulant on the stomach, and give a little weak tea of spearmint or catnip; and keep the patient quiet.

When a severe injury is not followed by shock or pain, but the patient looks a little pale and talks as unconcernedly as if nothing had happened, there is great reason to expect death in twenty-four to forty-eight hours.

Sprains.—In this class of accidents, the muscles and ligaments of a limb or of a single joint are suddenly and forcibly put upon the stretch. The parts swell, become exceedingly painful, feel heavy, are so stiff and sore that the least movement causes great suffering, and some feverishness may arise at times. Usually the more severe symptoms abate in a few days, leaving the joint and its muscles stiff and sore for a time; and then if neglected or imprudently used, the tenderness may continue for months and the partial disuse of the limb cause it to shrink permanently.

While the acute suffering and swelling last, wrap the parts in flannels wrung from a strong and warm lobelia infusion, or in large fomentations of mullein or of catnip; and keep these warm and slightly steaming by an outward wrapping of oil-cloth or oiled silk, or by hot irons. When the greater suffering abates, use a strong wash or tincture of lobelia and lady slipper every few hours, and follow with opodeldoc, then wrapping the part well and keeping at rest. In long-standing cases, give the part a vapor bath every day, follow with tincture of lobelia holding a drachm of oil of origanum to each four ounces, and rub well with the hand. A gentle application of an electric battery for ten minutes each day will be good to withering muscles. Great perseverance will be necessary.

Hemorrhage.—Loss of blood occurs under an endless variety of circumstances. If from the small vessels, it oozes away gently; but a large amount may be lost if the flow is prolonged or the bleeding surface is extensive. If an artery is open, the blood will be a bright scarlet color and will be thrown out in jets corresponding to the beats of the heart; and this source of hemorrhage is most rapidly dangerous. Blood coming from a vein is dark in color, and does not appear in pulsating jets but flows in a steady stream. Most veins will stop bleeding of their own accord, the blood coagulating and plugging the opening, as in small arteries; but a large vein bleeding may soon cause serious loss. When such loss is considerable, the person gets pale, is inclined to faint or

faints repeatedly, the pulse gets very small; a cold sweat finally breaks out, and the person is staring and delirious.

Ordinary bleeding is relieved by any good astringent to hasten the coagulation of the blood, by which the mouths of the bleeding vessels are closed and then good rest will give time for the closure to become solid. Among the astringents are beth root, oak bark, sumac bark, hemlock bark, tannin, alum, and the druggist's solution of iron. A strong fluid preparation is to be applied to the bleeding vessels, and repeated till they close. If a heavy clot form and the blood flows out by the sides of this, remove the clot so as again to get at the open vessels. But if a clot form and no blood flows out by its sides, the hemorrhage has been stopped and the clot must not be disturbed. If the *nose* is bleeding, the astringent must be snuffed up the nostril; all clothing about the neck loosened, and blood diverted from the head by putting the hands and feet in very warm water. A few thicknesses of fine paper put beneath the upper lip, and then pressure made outside of the lip entirely across it, will check the little arteries supplying the nose and arrest large bleedings.

If the jets show a bleeding artery, pressure on that vessel must be made at a point between the place of bleeding and the heart. It is prudent to do this even with small arteries, while taking other measures to close their bleeding mouths; and it is absolutely necessary to do it quickly and firmly in large arteries, lest death ensue. The place on which to make the pressure is at any point where the artery can be squeezed down against a bone. In the arm or hand, the artery near the arm pit, and just inside the fleshy muscle that covers the front of the upper arm, is the right one to stop. It can usually be felt beating; but if not, the fact of its compression will be made known by the jets of blood ceasing. In the leg, the artery on the inner side of the thigh between the line of heavy muscles there, is to be pressed; or else the great artery where it passes over the edge of the share-bone.

Pressure may be made with the ends of the fingers; and it must be very steady and continuous. As any person's fingers will soon tire of such steady force, another's fingers must presently replace them, but without lifting up the first person's fingers to let a rush of blood go down the artery. So soon as possible, replace the fingers by a round piece of wood or any other firm article laid on the artery and slightly cross-wise of it; and press this down on the vessel by tying a handkerchief around the limb and over the

piece of wood, and then twisting the handkerchief with a stick under it at a point nearly opposite the piece of wood. In this simple way any needed amount of pressure may be brought to bear at once upon the artery, and held there easily so long as needed.

Small arteries, where their bleeding has been arrested by the above mode of pressure, may then usually be plugged with a clot by gently pressing against the bleeding point a hard pledge of lint or cotton wet with a solution of alum, tannin, iron, or other strong astringent. This pledge must be made to reach the spot that is actually bleeding, and then gently bound upon it. After fifteen minutes or more, loosen the pressure on the artery above a very little trifle, and judge if the cotton pledge is effective. If a jet start, renew the upper pressure, remove the pledge and clean away the blood, and then renew the cotton and wait longer before again testing it. Pressure on the artery above may be continued for hours if necessary. Bleeding from the nose may have to be treated by plugging the nostril thoroughly with such a cotton pledge.

Arteries of middle or large size cannot be stopped by cotton pledges or astringent applications. They must be tied (ligated). A ligature should be round, smooth, strong. Heavy silk, in two or three strands, is best. The artery is to be tied on the side toward the heart, one-quarter to half an inch from the bleeding opening. It may be brought into view by catching it with a pair of fine pincers or a sharpened hook, and pulling it forward steadily. If necessary, cut down to it with a sharp knife; but be sure and bring it fully to view and separate it from everything else and especially from the nerve by its side. An artery gapes open, and appears as an empty tube if the pressure have completely stopped the bleeding. The ligature is now to be slipped under it and tied firmly; and then the pressure lessened and the current of blood allowed to return gradually to the vessel. Sometimes an artery has to be cut down to at a place quite above the bleeding point, and tied there; as when an injured vessel in the palm or sole compels one to tie the artery in the arm or leg before the hemorrhage can be stopped. Cut off the ends of the ligature about half an inch from the knots, and manage as for wounds. Few persons other than actual physicians care to do these things; but ligation is simple if one will but be calm and use his common sense, and to fail in doing it may be to let a man die when a little firmness might save his life.

Bleeding veins must never be tied. Blood flowing from them comes from the side farthest from the heart. Apply goodly pressure below and also above the opening by a few thicknesses of cotton, and draw a bandage snugly around it.

Wounds.—First arrest the hemorrhage, if it is considerable; if inconsiderable, pay no attention to it, but bring the parts as closely together as possible and keep them there. Strips of good plaster are best for this in all ordinary cases; and stitches are to be avoided except when a wound is too long or deep, or in a position where plasters cannot be depended on to hold the parts firmly in place. These stitches must be taken, with smooth and rather coarse silk, half to three-fourths of an inch apart, as few as will be effectual, thoroughly through the skin, and usually half an inch from the edges of the wound. Tie with moderate firmness, but not too tightly; and then bathe the surface to cleanse it, support the stitches by long strips of adhesive plaster, and wrap a bandage around all if possible. Simple dressings are then the best, keeping the parts cool and clean without disturbance for five or six days, then removing the stitches, washing with borax water if there is discharge, and managing as for Healing Ulcer.

Wounds caused by machinery and similar violences are called *lacerated*, the flesh being much torn. Stitches can be used here; but the patient must be rallied from the shock (see above), the wound carefully cleansed, bathed with borax water and soap containing a little compound tincture of myrrh, and covered with lint wet in golden seal infusion with a little myrrh tincture. After this, the parts must be managed according to the class of ulcers the wound inclines to, whether weak, gangrenous, or healing. Lacerated wounds are the kind that oftenest cause lock-jaw, and especially if any foreign substance is left in a penetrating wound of this kind. Wounds of the *scalp* must not be stitched; but the hair is to be shaved or closely cut off for some distance, and the edges of the wound brought together by adhesive strips and then a close bandage, leaving the lowest points open for the escape of pus. Such wounds are always liable to danger, and demand rest and care.

Concussion of the Brain, or “stunning,” produces the usual symptoms of shock. If severe, it will cause deep stupor and semi-paralysis of the whole system resembling a stroke of apoplexy; and these conditions may continue a considerable time before reaction commences. The surface heat returns slowly, and

vomiting is most probable. It has long been a common practice to bleed these patients, and it is still a popular opinion that bleeding is demanded. Nothing could be more injudicious, for in such depression the loss of but little blood from an artery may extinguish the last hope of life. Perfect quiet, outward warmth, and the use of stimulants as elsewhere directed for *Shock*, are the proper measures; and afterwards soothing nervines like lady slipper, and great care to unload the bowels and to draw off the urine with a catheter if it does not flow of itself.

Foreign Bodies sometimes get into the nose or ears of children, and cause much apprehension and sometimes injudicious attempts at removal. A flat and thin substance or probe, with shallow grooves cut across it on one side, may usually be slowly pushed beyond and back of such a body in the nose, and the grooves will aid in gently working the offending article downward and outward. By care and patience in using the ear scoop, such bodies may be removed from the ears.

Coins are sometimes swallowed by children, and mothers get much alarmed. No need of anxiety. Don't give an emetic nor a purge, but feed the child on bread and milk for a few days and let Nature attend to the case.

CHAPTER CXXII.

POISONS AND ANTIDOTES.

Acids.—Sulphuric acid (oil of vitriol), nitric acid (aqua fortis), and hydrochloric or muriatic acid, are usually called the mineral acids. They act by immediately corroding the tissues of the mouth, gullet and stomach; soon cause violent burning sensations and vomiting; great distress of the abdomen aggravated by the least pressure; the ejection of mucus, blood and membranous shreds; gaseous distension of the bowels, and enormous belchings of gas without relief; difficult breathing; collapse and death in from six to twenty-four hours, if the poison is not quickly antagonized. *Antidotes:* Any mild alkali whatever,—as cooking soda, chalk, lime from the ceiling or elsewhere, plaster from the wall, magnesia. Give in water, a tablespoonful at a time every few moments, gradually lengthening the time between the doses. At

the same time give freely of elm or flaxseed tea, gum water, flour mixed in water, or any mucilage. The antidote may be put in the mucilage. Give sweet oil or any other oil,—a tablespoonful every two hours after the acid has been checked in its action. Inflammation and ulceration of the stomach remain, and must be treated carefully for many weeks or months.

Oxalic acid is in crystals, sometimes mistaken for Epsom salts. It causes the symptoms of other strong acids; but the sufferer sinks with great rapidity, and may die in thirty, or twenty, or even in ten minutes. Lime (or chalk) is the best antidote, but there is rarely time to give that or anything else.

Arsenic.—In half an hour to an hour there begin to be depression and faintness, intense burning and tenderness at the pit of the stomach, vomiting that increases the distress, then violent and painful purging in most cases with very offensive stools, great thirst, feeble and irregular pulse, cold and clammy skin, difficult breathing, scanty and bloody urine. In eighteen to seventy-two hours of such terrible suffering, the patient may die in collapse, or have convulsions or stupor before death. *Antidote:* Hydrated oxide of iron, a pulpy mass usually kept ready in the drug stores, is a reliable antidote, especially to arsenic that has been taken in solution. Carbonate of iron may be used, but is not so effective as the other. While waiting for this, provoke vomiting by tickling the throat with the finger or a feather, and by copious draughts of salt water with a little mustard in it, so as to dislodge any of the arsenic yet in the stomach. Give the pulpy iron preparation in doses of a tablespoonful every five or ten minutes, till it is judged that no poison remains in the stomach unchanged. During this time, give freely of milk, flour stirred in water, or the whites of eggs in water,—which envelop the poison and also encourage its removal by vomiting. Subsequently treat as for inflammation of stomach and bowels.

Chronic arsenical poisoning is sometimes caused by the arsenic in bright-green or some brown wall-papers; as also by the articles used in making artificial flowers, millinery, brass works, dyes, etc. It causes sensitiveness to light, loss of appetite, pains in the stomach with irritative diarrhea, muscular weakness, irritation and vesicles on the skin about the neck, head, hands and armpits. Hose and under-garments dyed with some aniline colors containing arsenic, give the same course of symptoms. Change of occupation, removal of wall-paper and suspected garments, country air, and such

tonics as seem best suited to the particular troubles of the stomach and bowels, are necessary. It takes a long time to get rid of arsenic thus slowly introduced to the system.

Carbolic acid whitens and shrivels the tissues it touches, corrodes them, causes most intense sufferings in the stomach followed by stupor, green or black urine. No reliable antidote is known, but the free use of oil or lard allays the terrible agony.

Corrosive sublimate is the stronger of two compounds of mercury, of which calomel is the other. Chronic poisoning by it and by calomel gives the salivation, wasting, trembling paralysis, gangrenous ulcers and other breakages of constitution so familiar in past years from the professional use of small doses of these drugs. Acute poisoning by the sublimate immediately causes intense burning in the mouth and throat, excruciating pain in the stomach and abdomen, colic and swelling of the abdomen, suppression of urine, vomiting and purging of violent character and often of blood; together with dryness in the mouth and a brassy taste, pinched face, cold and clammy skin, and weak pulse. If relief is not soon obtained, the sufferer dies in collapse. If he recover, salivation, and other prolonged results of chronic poisoning are probable. *Antidotes*: The white of one or more eggs, quickly beaten up with water and swallowed at once, is best. If not at hand, give flour beaten in water to a thin paste, used freely. If vomiting is not free, promote it at once by drinking the thin paste abundantly and then tickling the throat with the finger. For the thirst, let milk be taken freely; and an equal quantity of lime-water with it, if procurable. Whitewash may be scraped down to make the lime-water.

Copper sulphate (blue vitriol), and *copper acetate* (verdigris) are very active poisons, causing an astringent and coppery taste in the mouth, tight feelings in the throat, severe pain in the stomach, violent vomiting and purging, jaundice, presently sharp spasms, and collapse and death in a few hours. Vomited materials have a greenish-blue color. *Antidotes*: Give white of eggs, or flour and water, as for corrosive sublimate, and encourage free vomiting till the stomach is emptied of the copper. Workers in brass and bronze, which are alloys of copper, become slowly poisoned, and suffer chronic and irritable diarrhea with colic, tenderness of the bowels, greenish discoloration of the hair, and failure of strength. It is imperative for such persons to change their occupation, and to follow a rigid course of hygiene.

Soda and Potash, whether in caustic form or as washing soda, give nearly the same symptoms as poisoning by sulphuric acid, purging being decided. *Antidotes*: As the mild alkalies neutralize the acids in poisoning by the latter, acids must in turn be used in poisoning by alkalies in these corrosive forms. Give vinegar very much diluted,—a tablespoonful or two at a time every few moments rather than a full draught. Diluted lemon juice may also be used. Olive or linseed oil, or lard, may also be given,—forming a soapy compound with the alkali, which promotes vomiting. Follow with flour in water or other demulcent drink.

Opium, and the different forms of *Morphine* or *Morphia* obtained from it, are known as narcotic poisons. Their especial action is in depressing nerve sensibility, and producing a state of stupor more or less profound. The face is flushed or purplish, skin warm and dry, pupils greatly contracted, breathing slow and labored, and the patient in an unconscious sleep from which he may be more or less aroused by shaking and by shouting in his ear. These are the symptoms from which recovery is most probable. A deeper set of symptoms, from which recovery is very rare though sometimes possible, are such profound stupor that it may be impossible to arouse the patient to the least sign of consciousness; face pallid and blue, skin bathed in perspiration and gradually becoming cold, breathing very slow and shallow, at times appearing to cease, pupils contracted to pin-points but perhaps dilating just before death. A fatal termination is usually reached in from seven to twelve hours; but if the poison be taken when the stomach is full, this may be delayed by several hours, while an empty stomach will hasten it.

Antidotes are not known, but astringents are believed to render it nearly insoluble and thus to moderate its action and give a better opportunity to remove it by the stomach pump. If vomiting can be induced early, it should be done,—mustard and salt in warm water being best for this purpose. Strong coffee given hot and as freely as can be taken, is as near a stimulating antidote as we seem yet to have. In three rather profound cases that have come under my care, I have used a strong infusion of bayberry to procure its astringent and stimulating effects, giving all I could get the patient to swallow every five or eight minutes, in two of the cases obtaining vomiting after a time, and saving all three of them. Meanwhile the patient must be aroused by every possible means. Shout; walk him about almost constantly, even if for hours together;

slap the chest and soles and palms lightly and briskly at short intervals with the end of a wet towel; alternate little dashes of cold and warm water in the face; apply at intervals and for ten minutes at a time a rather strong current of the magneto-electric (crank) battery from the nape of the neck through to the breast-bone. Keep up these measures with unceasing perseverance, and success may be the reward after many hours of apparent hopelessness. Be very watchful against relapses after the patient is seemingly safe.

Phosphorus.—Children sometimes get poisoned by eating the phosphorus on matches; and sometimes these and phosphorus "rat paste" are used with suicidal intent. Its symptoms are a disagreeable taste and speedy vomiting in most cases, possibly some colic and diarrhea. Slowly, during the next two or three days, there arise a weak pulse, listlessness, some jaundice, much headache and sleeplessness, low form of fever, scanty and high-colored urine. If relief is not obtained, these symptoms pass onward to violent bilious vomiting, gradual sinking, and death in from six to ten days; but large quantities may be fatal in a few hours. Some have faintness, convulsions, and finally stupor; others vomit blood and have bloody stools; and nearly always there is a distinct garlicky odor to the breath. *Antidotes* to phosphorus are not known, except as turpentine in doses of ten drops every hour or two till relieved is supposed to antagonize it,—which is only a problem. Quick vomiting by tickling the throat with the finger after drinking freely of flour in water, is best to dislodge any of the article still in the stomach; after which the demulcent drink is to be given in considerable quantities every two hours or oftener, with a tea-spoonful of calcined magnesia in each dose.

Strychnine, or *Strychnia*, obtained from the seeds of *nux vomica* or dog-button, is exceedingly active as a poison, beginning to show its effects in five to fifteen minutes. At first there are great restlessness and excitement with the senses much sharpened; then a choking or suffocating feeling; presently quivering or trembling of the whole body and jerkings of the head; and probably in a moment there is a convulsive stiffening that bends the body backward, almost stops breathing and turns the face livid, draws the face into a peculiar grin, clenches the fists, tightens the jaws, etc. In half a minute or more this spasm gives way, the patient lies relaxed and exhausted and bathed in perspiration. Such convulsions are repeated every few minutes,—a touch or motion start-

ing a fresh one,—the patient dying in half an hour or an hour unless decidedly relieved, the mind remaining clear to the last. No *antidote* is known, though lately it has been asserted that half a teaspoonful or more of kerosene given between each convulsion will arrest the poison. If possible, secure vomiting with ground mustard mixed with flour and water and given freely. Action has to be very prompt; and one difficulty in the way is, that the patient cannot swallow during the spasm while handling him provokes another spasm. The relaxation of chloroform seems most capable of tiding the system over these terrible spasms, and thus averting the danger caused by the great exhaustion and stoppage of breath. Chloroform may be inhaled, and two to twenty or more drops diluted and given by the stomach between the paroxysms; and if he become partially unconscious and the spasms stop, inhalation of moderate quantities may be used to hold him in this state for many hours.

Ammonia (spirits of hartshorn) is an alkali, and produces symptoms analogous to those of potassa and soda; but is not so rapidly fatal unless large quantities have been taken, when death may be speedy. It inflames the mouth, throat, nostrils, and air passages,—causing them to swell greatly, and producing more or less excoriation; and the sufferings and destructions in the stomach and bowels caused by the other alkalies, follow quickly. It is to be met by the use of diluted vinegar or lemon juice given in small doses rapidly, with free draughts of milk or flour in water. If the inhaled vapor has attacked the air passages, vinegar may be inhaled. A tablespoonful of sweet oil, repeated three or four times ten minutes apart, will moderate its power. Subsequent inflammation of throat and stomach is to be managed with demulcents and oils, as in other inflammation of these parts.

Saltpetre, (nitre, potassium nitrate), has been taken in mistake for Glauber's salts. It has caused death in from five to seven hours, producing cold, clammy and blue skin, irregular and almost imperceptible pulse, heat and pain in the stomach, vomiting and purging that may be bloody, constant disposition to sleep, final insensibility, and sudden death that may be preceded by slight convulsive twitchings. No *antidote* is known. Give freely of flour and water, and excite vomiting by tickling the throat.

Iodide of Potassium, even in what are called "medicinal doses," frequently causes great mischief. Taylor, in his *Medical Jurisprudence*, tells of a man taking four doses, which caused "a violent

shivering fit, followed by headache, hot skin, intense thirst, quick and full pulse, vomiting and purging, succeeded by great prostration of strength. The purging continued for several days; and there is little doubt if the patient had taken another dose he would have been killed." No antidote is known; but vomiting should be secured by large quantities of flour or starch in water.

Snake Poison.—The virus of poisonous reptiles is generally rapid in action; yet the first shock may be rallied from in a short time, and the absorption of the poison produce later effects. The shock produces feelings of great depression, paleness and a cool perspiration. In from half an hour to several hours after, the wounded place swells, becomes painful and looks mottled; the surface becomes cold and puffy, vomiting is common, the pulse and breathing fail, various dark spots appear over the surface, and the place bitten becomes gangrenous. *Antidotes* are not known; and the hopes of treatment lie in sustaining the system vigorously against the depression, and then in securing the speedy ejection of the poison. On the absurd proposition that one poison can cure the effects of another poison, it has become common to give snake-bitten persons large quantities of whiskey. It is a poor practice. A much better plan is, *first*, to tie a band firmly around the limb above the wound, to interfere with the absorption of the virus. If some person would then suck the wound, the poison would be withdrawn and the effects be at once arrested. Such a recommendation seems rash; but it is not so, and it looks frightful only because the scientific facts are not properly understood. Snake virus is dangerous only when it finds its way to the blood through a break in the skin or mucous membrane. It positively will not be absorbed if sucked from a wound into the mouth; for the saliva itself neutralizes it, and it cannot be taken into the blood that way. It is then as harmless as drinking soda-water full of carbonic acid gas; for the stomach will not absorb this gas, though its inhalation into the lungs would be dangerous. Life would nearly always be saved if this course were followed.

The best stimulants under these circumstances are those which themselves are perfectly harmless. Ginger and cayenne are the best. Virginia snake root is invaluable, and has obtained its popular name from its known efficiency in such emergencies in the Virginia mountains,—where the snakes and plant both abound. Prickly-ash is good. *Dioscorea*, blue cohosh and black cohosh are of the greatest value for sustaining the nervous system and

hastening the elimination of the poison. The spicy root of devil's bit or gay feather, common to our western prairies, is admirable. Any combination of these may be used, and should be given in large quantities. Persons exposed to this class of dangers should have with them a preparation—tincture or fluid extract—of ten parts ginger, five parts each blue cohosh, black cohosh and dioscorea, and one part cayenne. This may be given in water, every five or three minutes, till the system has been aroused from the depression; and then continued according to the apparent needs. Very large doses are needed; and half a tablespoonful or more of the fluid extracts, in two or more tablespoonsfuls of water, will be none too much if the stomach will retain it. As the poison tends to cause gangrene, give half a teaspoonful tincture of myrrh, or ten to twenty drops compound myrrh tincture, in every third dose of such a preparation; and apply the compound myrrh tincture freely to the wound. In the absence of myrrh, the common smart-weed may be pounded and applied to the wound; and any of the above-named stimulants, including smart-weed, may be given by infusion or any other form, if the preparation named is not at hand. Ply the remedies very rapidly, for time is precious; and where everything is prostrated and rushing toward gangrene, stimulants and antiseptics (which include red and black pepper, and gum myrrh) are not to be used with any stinting hand. If the first hour can be passed in safety and reaction secured, hope is pretty certain.

Ivy-vine (*Rhus toxicodendron*) resembles the American woodbine; but the woodbine has five leaves in a group, whereas the poison ivy has but three. Some persons are so susceptible to this poison that the wind blowing over the vine seems to affect them, while others can handle it with impunity. It causes a rapid development of inflammation and swelling quite similar to erysipelas, with intense itching and burning, frequently followed by vesicles and annoying sores. A strong wash of lobelia quickly allays the burning; a few grains of soda hyposulphite may be added if the blood redness is bright; but if it become dusky or the sores linger and spread, use golden seal with the lobelia, adding a little glycerine to keep soft the cloths that should be laid on the parts and kept constantly wet.

Poisonous Foods.—Common articles of food become highly poisonous when they have undergone certain chemical changes tending to putridity, even when these changes may not be especi-

ally noticeable to taste or smell. Whole companies are sometimes poisoned by old cheese that has been cut and exposed to the air too long, or by stale ice-cream,—the alterations being too slight for the senses to detect, yet the results of their use being very pernicious. Unsoundness in meats and vegetables may consist in putridity, or in mouldiness (*fungi*) in meats or bread, or in the animal having eaten poisonous plants, as the honey of bees which they have gathered from azalea, the flesh of hares that have eaten kalmia, the milk of cows that have eaten conium, etc.

“Tainted game, and indeed all kinds of meat in which putrefaction has commenced, may indubitably produce disease. This is chiefly of a diarrheal character, preceded by rigors and attended with collapse, and it may be convulsions and other signs of a profound affection of the nervous system. The effects of such tainted meat are slight compared with those which are produced by the sausage poison, developed by a sort of modified putrefaction in certain German sausages. These sausages, when they become musty and soft in their interior, acquire a highly poisonous character, and are frequently fatal in their effects. The symptoms produced by their use are pain in the stomach, vomiting, diarrhea, depression, coldness of the limbs, and weak, irregular heart action. Fatal cases end in convulsions and oppressed respiration, death ensuing from the third to the eighth day. Unsound and even rotten vegetables may be consumed, especially in hot summers, and become fertile sources of various forms of poisoning. The symptoms are usually of a diarrhoeal character, not often of alarming severity but sometimes attain a fatal severity.” *Dr. Thomas Stevenson, Lecturer at Guy's Hospital, in Quain's Dictionary of Medicine.*

Special treatment for such poisoning cannot be given, but certain principles must be followed. If the offending food is yet in the stomach, a very prompt emetic should be given. A tablespoonful of neutralizing cordial every hour till the bowels move, will correct acidity there and carry off the rotting substances. If sinking occur, the stimulating measures should be adopted as in collapse (p. 611).

PART III.

MEDICINES AND PREPARATIONS.

REMEDIES *versus* POISONS.

THE remedies prescribed in this book are such as the people can most easily obtain, being chiefly our native plants. None but harmless and sanitive articles are directed. These are mercifully provided for us in our woods and fields, and at our very doors, in abundance. Such sanitive agents harmonize with the life and functions of the system, and aid the Vital Power in its struggle against disease (p. 11.) In such agents there lies *perfect safety*; for they do not make disease, do not endanger life, never injure the general health, never damage the tissues, never weaken the constitution, leave no ill effects behind them, and can be given in any desired amounts until they effect the purpose they are needed for. Children of tenderest years, ladies of the most delicate constitutions, invalids of the utmost sensitiveness, can use these remedies with absolute confidence; can portion the dose according to age, can increase it to any needed extent, can continue it for any desired length of time without the least apprehension of doing harm to the body.

Yet these remedies, while so perfectly *safe*, are also *powerful* in their curative action. Indeed, they are the most powerful known to man; for they co-operate with fresh air, sunshine, good food, pure water, proper clothing, and the other hygienic influences in restoring the blood and tissues to their natural conditions, and in resisting and removing the causes of disease. Their qualities and strength are always exerted for good, and not for evil; and in this they can always be relied on, never being treacherous in their action, nor working mischief and ruin when benefit was expected from them. It is because of these admirable qualities of sanitive remedies that they can be used so effectively by the people, and are noted for saving thousands upon thousands of

lives that, under the use of a different class of agents, had been given over to die. Men who know nothing of their magnificent curative powers may think them but worthless "simples." As the Divine Creator did not consider it beneath his omnipotence to make them and to endow them with their wonderful healing powers, men who are familiar with their properties are grateful for the blessings given for saving health and life.

It is the general practice of the large majority of physicians to use poisons in the treatment of disease. This practice came down from the centuries of darkness, when knowledge was very limited, and when the crudest forms of superstition and speculation passed as science. It was in those ages that vermin, toads, reptiles, entrails, dead men's skulls, and other disgusting things were used as medicines. Such articles were the "strong medicines" of those days, and so continued till within three centuries. When the people finally revolted against them, and took to curing themselves with safe herbs, they were dropped and for them were substituted calomel, corrosive sublimate, tartar emetic, arsenic; and thence onward to aconite, veratrum, strychnine, prussic acid, and hosts of other dangerous articles.

The whole of this practice is founded on the idea that a disease is to be cured by giving an agent that will make *another* disease in the same organ. Thus, a severe disease is to be driven out by a "strong medicine," which always with them means a violent poison. In turn, the disease that the *strong* poison made, is to be replaced by another disease caused by using a milder poison, and this again by using a yet milder poison; till at last the weakened and broken-down system, to which it would be fatal to give any more poison, is turned over to Nature to cure "as best she can" by good food, sunshine, air, and other hygienic means. How common it is to see a patient go down, down, down, till this line of treatment is stopped; when at once he begins to mend, and will get well if left to the kindly hands of Nature and good nursing.

I repudiate all such follies and dangers as not being true science. It is not good reasoning, to assert that agents and articles which by their inherent properties *cause* disease and break down the constitution, can *cure* disease and build up the constitution. Nature permits no such paradoxes, allows no such contradictions in her laws. The assertions of men cannot alter the established facts of science. That which God has stamped with powers of evil and

destruction, man cannot endow with qualities of healing and salvation.

Many who use poisons, when they have pointed out to them the dangers of such a practice and are shown the fatal results thereof in the hands of their own most learned and skillful men, resort to fallacies to defend their use. They think there is no clear definition of what a poison really is, even while asserting that nothing can have power over disease unless it is a poison. And they claim that the most harmless articles can become poisons when used improperly,—instancing the fact that a man can eat enough of the best food to make him sick, or to kill him.

Everything in creation has certain limits to its capacities and powers, including a man's stomach. If one attempt to put forty gallons of water into a barrel that can hold but thirty gallons, he must expect the extra ten gallons to run over. If one put into the stomach more food than it has power to digest, he must expect the surplus to distress him by its bulk; and to ferment or putrefy in his body, seeing the natural capacity and power of his system cannot digest it. Fermented or putrid beef-steak, potatoes, green corn, bread, butter, etc., are no longer foods. Chemical change has altered their qualities, and they cannot now sustain life. No man would eat molded bread or strong butter, for he knows they would make him sick. Foods *in* the stomach that have fermented or become half putrid, are no more fit for the purposes of life than when in the same altered state out of the stomach. In or out of a man's body, rotten food is poison (p. 623); and if one eat more than he can digest, he must expect the consequences of partially poisoning himself. So easily explained is this mistake in physiology. The very argument that would ask us to forget the laws of Nature in order to sustain an error of the dark ages, only the more fully proves that anything which is hurtful to the body cannot do other than injure that body,—proves that decaying foods are always the cause of disease and possibly of death, and never can be used with safety or become nutritious.

A poison is any article calculated, by its nature, to cause detriment to the human body. Shift the words or multiply them, that is the simple idea always connected with a poison. It means that the inherent qualities of an article are damaging, that the properties stamped upon it by the Creator are dangerous to man, that its influence upon the system always tends to the production of disease and may cause death. That men of high education use

poisons, is no proof of their good qualities ; for a man's education may warp his judgment. Education cannot alter the facts and laws of Nature ; and a poison given by a very Solomon will do its work, just as the bullet from a pistol in a loving brother's hand may cause death, though the brother "didn't know it was loaded" and had no unkind intentions. That men recover after using poisons, is plain enough. They also recover after breaking bones, suffering burns, meeting sprains, having limbs cut off, smashing through railroad accidents, and enduring hundreds of other mis-haps. A man's life power, when his constitution is vigorous, will enable him to live through numerous and severe injuries ; but that is to the credit of the wonderful vital force with which he is endowed, and by no means suggests that the cruel accidents were good for him, or could by any possibility be made good.

The size of the dose given cannot alter the qualities of a poison. Its most minute fraction has precisely the same disturbing power as the entire mass ; even as the least particle of salt has the same particular savor as a ton of salt, or as the smallest grain of sugar has the same property of sweetness as a barrel of sugar. So far as the minute dose goes, its action is of the same *kind* as the larger dose would be ; but it can be resisted the more effectually by the vital power, and therefore does not so openly and quickly lead to damage. But let the small dose be repeated frequently, and its damaging effects will soon begin to appear. How common it is to see infinitessimal potions of arsenic render the blood watery, or of mercury produce tremblings and salivation, or of nux or pulsatilla make nervous and hysterical wrecks of the ladies who indulge in their use.

It is in giving quite small portions of an article for a length of time, that its real character can be tested. If it is a sanitive agent, capable of doing good and not harm, the fact will be most thoroughly proven in this way ; for small doses can be continued almost indefinitely, or even increased to considerable doses, and not a tissue will be damaged nor a function be impaired. But if it is a poison, it will not be long till its deleterious effects will become apparent. Weakness and debility will follow, functions will be disturbed notably, tissues will begin to break down, the heart and nerve centres will begin to suffer ; and that article must be discontinued, or permanent injury or a broken constitution will result. Test any suspected article in this way, and its true character will soon be shown. All the poisons used in practice have been thus

tested, and their damaging properties proven. And any supposed "skill" in their use, means only that one physician is more expert than another in deciding when to stop giving them so as to come just short of serious danger. But every dose given, be it large or small, works its own share of evil influence so far as it acts at all.

It is because the harmful effects of poisons are checked by the vital force, that their real characters are for a time concealed. If there were not this constant and prompt resistance by the life principle, which is always on the alert to protect the body, the danger of poisons would be visible at once and they would be discarded quickly and forever. This resistance is proportioned to the vigor of the constitution (p. 23); and persons of a feeble constitution have such a limited resistive power, that even the boldest do not dare to give them any of the stronger poisons. The strong poisons are reserved for the good constitutions until these break down under them.

Even in the best constitutions, and under the most favorable circumstances, there comes a time in the most careful use of a poison when the resistive powers of the frame have reached an end. Farther resistance is impossible. So much has the vigor of life been weakened, that it hangs trembling in the balances; and another, even a limited, dose of the poison turns the scales on the side of danger and the system fails unexpectedly and rapidly. Those who give poisons explain this under the expression of "the cumulative action of drugs." By this is meant that, a poison having been given in small doses for some time without dangerous symptoms having arisen, another dose may cause such a rush of dangerous symptoms that it would appear as if the total effects of all the previous doses had accumulated in that last portion. Every dose given, however small, had been reducing the power of life. No man can see when this reduction has reached the lowest point of safety; but let another dose be given, and then it will be found that there is no longer sufficient force to stay the dangerous drug, which asserts itself in its full destructive powers.

It was a knowledge of this common fact that, many years ago, led an eminent writer in the *Boston Medical and Surgical Journal* (the oldest medical periodical in America) to say of poisons that, "however much they differed in some respects, they all agreed in this: That they suddenly and unexpectedly extinguished a large portion of the vitality of the system." Whoever uses poisons is tampering with life. He may not destroy it outright, but he is

reducing vitality; and, at a moment when least expected, the "cumulative action" of the poison may *extinguish* it in part or altogether. Everybody has known of people who died so "suddenly and unexpectedly" that every friend and neighbor was shocked by the occurrence. In the course of what seemed to be a trifling disease, they died almost within an hour,—perhaps but a brief time after the doctor at his usual visit had pronounced everything going on encouragingly. The physician himself could not foresee the danger. Death is set down to "a mysterious dispensation of Providence." Let us not dare to be impious, and charge against God a thing in which God may have had no part. Poisons had been given to the sick man, with the very best and noblest of intentions, yet with full knowledge that every poison has inherent powers that enable it to injure and to destroy. Their use is an insidious war upon life. God has provided, in abundance, harmless yet powerful remedies for the relief of human ills. The safe medicines lie all around us. If any man disobey the laws of his life, and proceed to take poisons while neglecting to learn and to use God's innocent means of cure, let us consider thoughtfully why he dies "suddenly and unexpectedly."

Some years ago, in company, a lovely lady rallied me on my opposition to the use of bromides, asking if I had yet learned how truly valuable they are. I somewhat earnestly replied that those who knew most about them told us that the bromides give relief to nervous irritability by weakening and depressing the whole system, including the spine and the heart, and might cause sudden death from progressive exhaustion; and I preferred not to risk these results by giving it to my patients. She laughingly said she was taking a large dose of bromide of potassium three times a day, had done so for several weeks, and was not dead yet. Two weeks later she took to her bed with no other trouble than the "muscular weakness, general mental and bodily sluggishness, marked sleepiness, depression of spirits deepening into complete apathy, lying in bed scarcely more than a feeble automaton," "lowering of temperature and progressively increasing paralysis," (U. S. Dispensatory), which are the well-known results of using this now popular drug. It was a clear case of bromine poisoning. One morning she arose very late and sat on the edge of her bed, spoke a few words to her daughter, stood upon her feet a few moments, and then sank down and died without a word. Was it "a mysterious dispensation of Providence," or was it the "cumulative

action" of a poison that "suddenly and unexpectedly extinguished vitality?" Sudden deaths have become remarkably frequent of late years. Why? Very many of them are attributed to heart disease, though disease of the heart had never been suspected.

A final argument, an argument considered to be a triumphant defense of the use of poisons, is the assertion that the dangerous effects of one poison can be antagonized by giving another poison of a totally opposite mode of action. Thus, belladonna is given to counteract the poisonous effects of opium and morphine, and morphine to antagonize those of belladonna; foxglove and aconite are in like manner classed as counter-poisons, chloral and strychnia, and so through a long list. If this were fully proven, then it would stand as a scientific fact that an article capable of rapidly making one dangerous disease could be relied on to cure a dangerous disease made by other articles; and the entire scheme of using poisons as remedies would be substantiated.

But these statements are merely speculative, and are by no means proven. In every reported case where it was supposed that one poison antagonized another poison and saved life, it is noticeable that the most vigorous measures of every kind were also employed; and yet no credit is given to the stomach-pump, emetics, flagellation, electricity, and similar means used in the case. On the other hand, tests of the proposition have been made on animals, and poison used to counteract poison without aiding them with other agencies. M. Rogers, in a communication to the Paris Society of Biology, June, 1888, reported as the result of experiments thus made by him, that animals succumbed to doses of morphine and atropine (supposed to antagonize one another) long before the fatal dose of either drug, taken separately, had been reached. So of other poisons that it had been believed would neutralize each other. Either poison, given to overcome the effects of the other, caused death sooner than if but the one were given. Thus the idea that a cause of disease can be useful in maintaining life against another cause of disease, falls to the ground in the face of carefully observed facts. Naturally enough, two are stronger than one.

In whatever light it may be examined, there is nothing to commend the use of the poisons but everything to condemn them. The question should never be one of prejudice nor of personalities; for it is simply one of plain *facts* touching the protection of human health and life. Every man should carefully consider this

question for himself, and for those dependent upon his guidance. Physicians may be honestly mistaken. They have been mistaken in times past, hence the use of vermin and other abominations has been discontinued; hence also the abandonment of blood-letting in consumption, of tartar emetic in pneumonia, and hundreds of other measures. At one time those methods were pronounced the best and most scientific possible; now they are utterly rejected, because they were found destructive of too much life. It is noble in any man to correct an error when he sees it; and it is wise in him to seek for it, especially when thousands of other men do *much* better in the practice of medicine without using poisons than he can do with their use. I am fully convinced that the objectionable medicines of the past were employed from a false notion. The aconite, bromides, veratrum, morphia, strychnine and many other poisons given to-day are employed on that same false notion; and I am persuaded that the humanity and calmer judgment of men will gradually see this fact, and in time reject everything of a poisonous nature.

The medicines advised in this volume have been tested by thousands of busy and successful physicians for three generations, and have been proven safe and reliable. In my own varied practice of thirty-seven years, they have been tried under the greatest variety of circumstances and through almost every emergency, and have been found most effective as curative means. The extensive and successful experience of thousands of men for an hundred years, cannot be lightly rejected.

DOSES OF MEDICINES.

IN this book, the doses of medicines spoken of are for *adults*, and are the usual average for persons of hearty build in middle life. As all the remedies used are harmless in character, the dose may be increased or given more frequently, in any case where the ordinary amount is not acting as fully as is desired. Such increase may be to any necessary extent, and the remedies may be continued for any necessary length of time, without apprehension of ill consequences. As elsewhere mentioned, (p. 232), the very best remedies are not to be pushed to force an excess of functional action.

Aged people, and delicate or highly sensitive people, require somewhat less than the average dose. With such it is a good plan to begin with about one-half the amount usually given, and then increase it as found necessary. Children require a reduction of the dose according to their age.

The following is a good rule to proportion by:

For children one year old, $\frac{1}{2}$ of the dose for an adult.

"	two years "	$\frac{1}{8}$	"	"
"	three "	$\frac{1}{6}$	"	"
"	four "	$\frac{1}{4}$	"	"
"	seven "	$\frac{1}{3}$	"	"
"	fourteen "	$\frac{1}{2}$	"	"

I have usually spoken of quantities by the *teaspoonful* and the *tablespoonful*, as being more convenient for the people to go by than the apothecaries' measures. In comparison with the apothecaries' measures for liquids, the following is near enough for all common purposes:

A large teaspoonful is about $\frac{1}{8}$ of an ounce, or one fluid drachm.

A large tablespoonful " $\frac{1}{2}$ " four " "

Two " " " I " eight "

With most *powders*, the bulk of a grain of wheat weighs about a grain, a heaping teaspoonful a drachm, a heaping tablespoonful a little more than half an ounce. Some very light powders weigh much less in these bulks, as salicin in a loose state, where three times that bulk would weigh but a grain.

DESCRIPTIONS OF MEDICINES.

AGRIMONY. (*Agrimonia Eupatoria*).—Agrimony is a common plant in many places, along the edges of fields and the borders of woods, rising one to three feet in height, hairy, and with a long spike of yellow flowers at the top. Both herb and root have long been used in medicine, and are soothing and mild astringent tonics. An infusion of an ounce or more to a pint of water is a good gargle in ordinary sore throats; and four to six tablespoonsful several times a day prove serviceable in aching and sluggish kidneys, bloody urine, weakness of the bladder (especially in children), coughs that are too loose, spongy gums, etc.

ALDER, Tag Alder, Swamp Alder. (*Alnus Serrulata.*)—A shrub growing from eight to fifteen feet, in swampy ground; oval leaves two to four inches long, and reddish-green flowers in catkins appearing in April. The bark of this alder is somewhat astringent, and makes a good wash for sore mouth and sore throat; and in weak and scrofulous ulcers it may be used as a wash, or the powder incorporated in poultices. Its most important use, however, is as an alterant and mild tonic in all forms of scrofula, glandular swellings, general skin diseases and impurities of the blood where such an article is needed. Three pounds of the bark will make a gallon of syrup; but it is usually combined with yellow dock, burdock, and other alterant medicines. Sometimes it may be used in chronic diarrhea.

ALKALIES.—Agents that, by chemical action, overcome and neutralize acids, are called alkalies. Among the most common of these used in medicine are lime water, chalk, magnesia, potassa bicarbonate, soda bicarbonate and carbonate, and soaps. Properly speaking, they are not curative agents; but they save the stomach and bowels much distress by correcting an acid condition in many cases of indigestion, diarrhea and colic, and in cases of poisoning by acids are necessary to prevent destruction of tissue and to save life. When used to correct fermentation of food in the stomach, they should not be given too near a meal lest they neutralize the gastric juice and arrest digestion. An hour before a meal, and an hour and a half after, will be as near as is advisable except under necessity. Small doses repeated at moderate intervals are generally better than large doses at one time. Used outwardly, they cleanse the skin, and also the discharges from sores,—though lime water cannot be used for such purposes.

ALLSPICE, Pimento, Jamaica Pepper.—This familiar article, the berry of an evergreen tree native to tropical America, is one of the mildest and most agreeable of the spices. Besides being a light stimulant, it is gently astringent. It is very useful in all colics, diarrhea, and excessive menstruation when painful, being usually added to other articles for these purposes. It is an ingredient of the Spiced Tea, Spiced Bag, etc.

ALOES.—Aloes of commerce is the dried juice from the leaves of various species of the aloe family, and is obtained from the Cape of Good Hope, northern Africa, Italy, the Barbadoe Islands,

etc. It is exceedingly bitter, and acts slowly as a rather irritating physic. Most of its action is upon the lower bowel, hence it is improper to use it when there are piles; and its persistent use may cause these tumors in delicate people. It is best used in cases of decided inaction of the lower bowel, a very small quantity generally being added to milder agents that act more on the liver. If made into pills, some powdered Castile soap should be used with it. By stimulating the circulation so low down in the bowels, it often promotes the menses of women, but is a very poor article to use for such a purpose. Dose about ten grains; but one to three grains are usually best, made into pills with leptandrin and soap.

ALTERATIVES. ALTERANTS.—Under these names are classed a number of medicines that are used to purify the blood, and to remedy such conditions of the skin and the glands as are caused by impurities of blood. The sources of such impurities are quite various, but are principally failures of one or more of the secreting organs. In some cases the liver is chiefly at fault, allowing bile to accumulate slowly and to poison the circulation,—giving rise to certain eruptions on the skin, preventing the healing of sores, etc. In other cases the kidneys are partly at fault; more frequently the lymphatic glands get sluggish, and “kernels” and other swellings follow; while yet again the skin is mainly the source of trouble; or improper and insufficient food, and bad digestion with costiveness, may be the origin of unhealthy or impoverished blood.

Medicines that remedy one or the other of these conditions, and gradually bring the failing organs to a healthy tone and action, are called alteratives. Among them are barberry, wahoo, fringe tree, gray ash, cascara, blue flag, wild indigo, and others which operate mostly on the liver and gall-ducts; yellow dock, sarsaparilla, tag alder, stillingia, yellow parilla, guaiac, and others which act on the general glandular system; burdock, staff vine, dwarf elder, and others which act considerably on the skin and kidneys. Alteratives act slowly, and are usually given not oftener than three or four times a day. It is always desirable to combine them, as several organs are usually deranged at the same time. Some cases require much of the stimulating class, as stillingia, parilla and guaiac, while others require more of the relaxing class, as staff vine and burdock. It is always desirable to combine these two classes in various proportions; and their action is generally aided by the addition of some general tonic, as a little golden seal or

balmony or columba; and it is common to flavor alterative syrups with a little essence of sassafras or winter green, or to add a very little prickly ash,—all which articles are themselves more or less alterative. Compound Syrup of Yellow Dock, and Compound Syrup Stillingia, are samples of good alterative syrups.

ALUM.—Alum is one of the strong astringents, and coagulates blood rapidly and firmly; hence is useful applied directly to bleeding vessels, spongy gums, etc. Occasionally it is used for spitting of blood, though vegetable astringents are better. It is not good for bleeding from the stomach, except under necessity, as it is too likely to excite vomiting. If heated, it swells up, dries, and may then be powdered; in which state it is called *burnt alum*. This makes a good application for falling of the palate; and is sprinkled on the “proud flesh” of sores to destroy it. A teaspoonful of alum in syrup, repeated two or three times at intervals of fifteen minutes, will excite vomiting; and has been used in inflammatory croup. From two to five grains in an ounce of rain water make a good wash for chronic weak eyes when the eye-lids are red, or when there is a pus-like discharge. *Alum whey* is made by heating to the boiling point a teaspoonful of alum in a pint of milk, and straining to remove the curd; the whey being very palatable to most persons as a drink in fevers.

AMMONIA, Spirits of Hartshorn, Volatile Alkali.—I do not consider this a proper article to use inwardly at any time. It and some of its compounds, as the carbonate of ammonia, are powerful excitants; but they are poisonous and dangerous. Under severe circumstances of fainting and other sudden losses of consciousness, it may be put toward the nostrils that its pungent odor may startle the nerves. Let it always be remembered that it does not answer to bring it very close to the nostrils at any time, for unconscious persons may inhale enough to injure their lungs without being aroused. One part of the ammonia liquid and rather more than two parts of cotton-seed oil make a soapy mixture known as *Volatile Liniment*.

ANGELICA.—Both the roots and the seeds of this well-known garden plant are used as medicine. They are warming and stimulating; and are employed chiefly for flatulence and colic, being given in warm infusion or by tincture alone, or in combination with such articles as ginger, dioscorea and peppermint. A weak warm

infusion, especially with camomile and pennyroyal, favors the return of the menses when checked by cold; and relieves some cases of painful menstruation. An ounce to a pint of boiling water is usually enough for an infusion.

ANISE, (*Pimpinella Anisum*).—Anise is a native of Egypt and Western Asia; and is now cultivated extensively in Spain, Austria, France, and elsewhere. The seeds have been used in medicine for centuries, and have a peculiar and pleasant odor depending on the presence of an essential oil. It is used for flatulence and colics, in which it is valuable, being also quite acceptable to the stomach. For such purposes it may be given alone, or in combination with peppermint, dill, fennel, angelica, or other carminatives. A little of it is a pleasant addition to cover the taste of very bitter medicines. A drachm of the crushed seeds will make a pint of infusion. The oil is to be preferred; and may be made into an Essence or a Medicated Water in the manner directed under these heads. One or two drops of the oil on a little sugar may be given as a dose, and repeated as needed.

ANTIBILIOUS PHYSIC.—Mix together, in powder, two ounces senna, one of jalap, one drachm ginger. This is a prompt and moderately stimulating physic, a suitable dose acting in from three to four hours. Its chief action is upon the bowels, which it evacuates quite thoroughly and usually without griping; but it makes little or no impression on the liver. It may be used in cases where a rather quick and active physic is needed, but is not a suitable article for continued use. The average dose is a moderately heaped teaspoonful, given in a few tablespoonsful of water with a little sugar. Larger doses act too vigorously for common use; and it is much better to give this medium dose, or somewhat less, and in four hours repeat one-third or one-half this quantity if the first dose gives no evidence of soon acting. By adding one-fourth of an even teaspoonful of cream-of-tartar, the action of this physic is rendered more prompt and a less quantity of it will be sufficient. It would better be given during the fore-part or middle of the day, so that its action may not occur in the night to disturb the patient. A suitable dose of this as of other medicines may move the smaller bowels, yet fail to procure an evacuation because of unusual sluggishness or obstruction in the lower bowel. In such case it will be better to give an injection than to repeat the physic.

ASAFOETIDA. (*Narthex Asafoetida*.)—"Fetty," as this article is often called, is a resinous and somewhat gummy substance obtained by drying the juice of an Asiatic shrub, having a peculiarly unpleasant and somewhat garlicky odor. It is a moderate stimulant, and is valued chiefly for its prompt action on the nervous system, at the same time that it slightly excites the circulation. It is of value in nervousness, restlessness, nervous irritability, hysterical feelings, cramps, spasms, colic, deficient and painful menstruation, and all such numerous functional disturbances of weakened nerves when there is no fever or inflammation present. While many consider its use somewhat of a reproach, this is a false sentiment; for nothing is more prompt and valuable in all these cases. It increases menstruation. It is best given in the form of pills, which may be bought of different sizes (1 grain, and 2 grain) and sugar-coated. Two to four grains may be used at bedtime, or at intervals of six to eight hours if needed. By rubbing half a drachm of the gum with four ounces of warm water, a milky emulsion is made that forms an excellent injection for spasms, severe colic, hysteria, etc. This "milk of fetty" may also be given by the stomach, a teaspoonful to two tablespoonsful every two hours or hour; but its smell is objectionable to many, although the stomach usually accepts it very kindly.

ASH, Black Ash, Grey Ash. (*Fraxinus Americana*.)—Reference is here made to the great ash trees of our forests, the bark of which is used. It acts slowly and mildly upon the gall-ducts, liver, and bowels, and promotes the discharge of bile in biliousness, jaundice, and torpor of the liver. It proves of service in habitual costiveness dependent upon sluggish liver, in dropy from the same cause, in high-colored and sandy urine, "ague cake," melancholy, hypochondria, etc. As a home remedy it is reliable for these purposes, mild but quite persistent in its action. It is of value in most cases of chronic ague; and in some of the skin eruptions caused by the blood being poisoned with bile and malaria. It is best combined with golden seal, boneset, or similar tonic in quantities about one-fourth that of the ash, and made into a syrup to be used three times a day. One pound of the dried bark with four ounces of golden seal and half an ounce of prickly-ash bark, will make two quarts of syrup; of which the dose may be a small tablespoonful. A solid extract may have some powdered bitter-root mixed with it and made into a pill, which is a good laxative.

ASTRINGENTS.—Agents of this class have the properties of, (1.) Drawing the minute fibres of some tissues closer together, thus giving them firmness and solidity and acting in a measure as tonics. (2.) Reducing the amount of discharge from mucous surfaces, and giving firmness to these membranes when too lax. (3.) Coagulating or clotting the blood, and thus becoming of great service in arresting bleeding. They may be divided into three classes according to the degree of their strength: *Mild*, as the leaves of raspberry, blackberry, witchhazle, and sumac; *stronger*, as beth root, geranium, sumac bark, bayberry; *strongest*, as kino, oak bark, hemlock bark, nutgalls, tannin.

BALM. (*Melissa*.)—A garden herb of a mild lemon-like odor when fresh, nearly odorless when dry. Its infusion forms a pleasant drink in fevers, and may be used freely. Better to use it warm, as this promotes perspiration.

BALM OF GILEAD, *Balsam Poplar*. (*Populus Balsamifera*.)—There are two species of this handsome poplar tree, cultivated for the pleasant fragrance of their brown buds. As a medicine these buds are resinous and stimulating, and are used for their action on the air-passages, increasing expectoration and causing a tingling sensation through the lungs. They should never be given in recent or irritable coughs, but a small quantity may be added to syrups for old coughs, dry asthma, and feeble conditions of the lungs. As they are not acted on by water, an ounce of the buds may be macerated in a pint each of alcohol and water; and of this tincture, one to two ounces may be added to a quart of cough syrup. Equal parts of glycerine and water extract their properties equally well, and make a better preparation to add to syrups. Heated in lard for several hours, they make a good stimulating ointment for bruises, wounds, old and indolent sores, etc.

BALMONY, *Snake-Head, Turtle-Bloom*. (*Chelone Glabra*.)—An erect herb two to four feet high, with large pinkish-white flowers at the top, blooming in August and September. The leaves are a strong tonic, stimulating the stomach, promoting appetite and digestion; suitable to dyspepsia in all forms when the stomach is feeble, languid and inactive; but not admissible in irritable forms of indigestion or chronic gastritis. Useful in debilitated states of the system generally. It acts somewhat on the gall-ducts and bowels, and thus makes a good addition to liver medicines; and is

sometimes of much service in chronic agues. A small amount added to senna or butternut increases their cathartic powers, and is of service in removing round worms, especially when the abdomen is large. Dose of the powder, five to ten grains three times a day. It is generally made in infusion, a teaspoonful to a teacupful of boiling water; a tablespoonful of this at meal times. It is one of the ingredients of Spiced Bitters.

Chelonin is a concentrated preparation that represents the article fairly well. It may be given in doses of one to two grains; and larger doses may be used as an antiperiodic in agues, especially combined with salicin.

BALSAM APPLE, *Balsam Pear*. (*Momordica Balsamina*.)—A climbing plant, native to the East Indies, frequently cultivated in our gardens for the sake of its fruit,—which is somewhat like a cucumber, four to seven inches long, tapering at both ends, warty, of a beautiful bright orange-yellow color, splitting lengthwise. It has an agreeable balsamic odor. Deprived of its seeds and tinctured on alcohol, (or, much better, steeped for several weeks in cotton-seed oil or olive oil), it forms an excellent application for bruises, wounds, deep burns, old sores, chapped hands, chilblains, and all similar conditions. Sometimes it is bruised and mingled with flaxseed meal, or bread and milk, for a poultice in old and foul sores.

BALSAM FIR, *Canada Balsam*. (*Abies Balsamea*.)—One of the most beautiful of our native evergreen trees. Under its bark are numerous small blisters yielding the thick, transparent, tenacious fluid—Balsam Fir, with a pleasant balsamic odor. It is a stimulating expectorant, and used in the same class of cases as the Balm of Gilead buds. It cannot, however, be mixed with water or syrups, but may be given in the following form: Half an ounce balsam fir, two ounces glycerine, two ounces honey; mix thoroughly by shaking, and flavor with a teaspoonful of essence anise. This is useful in old coughs with debility, half to a whole teaspoonful three or four times a day. An ounce of this balsam rubbed up with four or more ounces of lard, makes a salve that may be used for a time on very degenerate sores; but must be discontinued so soon as action has been started. In chronic congestion of the kidneys, with persistently weak and painful back, it is sometimes useful.

BALSAM PERU, BALSAM TOLU.—These two balsams come to us from South America. Being largely of a resinous quality, they are not soluble in water; but a syrup may be made by mixing half a pound of sugar, four ounces of water and half an ounce of balsam, then heating moderately in a closely covered vessel for two hours, and straining when it gets cold. A little of this syrup may be added to a cough syrup in cases of old coughs when a stimulating expectorant is needed, but is not to be used in recent coughs or when the air-passages are irritable. An ounce of the tolu syrup to a pint of a cough syrup, is sufficient.

BARBERRY, *Berberry*. (*Berberis Vulgaris*.)—Barberry is not to be confounded with bayberry. It is a hardy shrub of small size; cultivated for its graceful appearance, and for its clusters of small, bright-red and acid berries. Its bark is intensely bitter, and stimulates the stomach, liver and gall-ducts, improving appetite and digestion and clearing the system of bile. It is a most valuable remedy in biliousness, jaundice, loss of appetite with liver troubles; and in all cases where torpid liver has depressed the strength, lowered digestive powers, tinged the skin, caused eruptions on the surface, caused backache and torpid kidneys, and induced habitual constipation; and is of great service in chronic agues. It is usually best to combine it with milder articles, as four ounces each poplar and wild cherry, and two ounces barberry, macerated for a week in a quart of cider vinegar, which makes a desirable bilious tonic—a tablespoonful or less before meals. Sugar may be added to this.

BAYBERRY, *Wax Myrtle, Candle Berry*. (*Myrica Cerifera*.)—Bayberry bark combines stimulation and astringency, and is a remedy of much value. It gradually increases the circulation, diminishing excessive mucous discharges without really drying the mucous membranes. Useful in painful diarrhea when the bowels are not inflamed, in chronic diarrhea; combined with tonics in catarrhal forms of indigestion when there are no burning sensations in the stomach; a limited portion with cherry and other mild agents in catarrh snuffs; combined with squaw vine and cramp bark in female weakness and excessive menstruation, etc. It is a good article with golden seal as a wash and gargle in spongy gums, sore mouth, mercurial salivation, putrid and other bad forms of sore throat, diphtheria and scarlet fever; and when the stomach and

bowels are ulcerated in connection with such throat and mouth affections. It is an ingredient of Composition Powder, and of Compound Bayberry Syrup. The wax or tallow obtained by boiling the berries of this plant, forms a good ointment. For this purpose melt together at a *low* heat six ounces of lard and tallow and two ounces of cotton-seed oil; then add half a pound of bayberry tallow, strain when melted, and stir constantly till cold. This ointment is valuable for ringworm, tetter, scalled head, and many other sores.

BETH Root, Birth Root, Ground Lily. (Trillium.)—Several species of this plant are common in moist woods, growing as a single stem six to twelve inches high; and at the top of this three large, broad, dark-green leaves, bearing a single large flower at their axil. The root is rather fleshy, an inch thick and about two inches long; and is a good soothing astringent, slightly stimulating. It is useful to lessen excessive mucous discharges and give tone to these membranes, as in catarrh, catarrhal coughs, female weakness, chronic dysentery, etc. It is of much value in arresting hemorrhages, as from the nose, gums, stomach, lungs, bladder, in excessive menstruation, etc. It is generally used by infusion, an ounce to a pint of boiling water; and one to three tablespoonsful of this four to six times a day, or as a wash in leucorrhea. The powder may be applied directly to bleeding surfaces. It may be used in moderate quantities along with comfrey, spikenard, and such articles, as a syrup for old and very loose coughs; or for female weakness, and to prepare women for easy labor.

BITTER Root, Dogbane, Black Indian Hemp. (Apocynum.)—Grows along fences and hillsides, three to five feet high, oval leaves two to three inches long, small pale-white or blushed flowers in July, followed by two slender and drooping seed-pods three to four inches long. Every part of the plant, when wounded, will exude a little tenacious milky juice. The creeping root is several feet long, black-brown without and gray-white within.

Bitter root is intensely bitter. It acts sharply upon the gall-ducts, liver and bowels, and slightly on the kidneys. It unloads the liver freely, and acts as a physic in from six to eight hours,—a large dose usually causing some griping, which is best prevented by combining it with ginger or soda. Used principally in chronic jaundice, persistent biliousness, chronic congestion of the liver,

gall-stones, and old agues, and with tonics and slow diuretics in dropsy. Not suitable when the stomach and bowels are irritable; nor during fevers, but is best adapted to old and sluggish cases. Dose of the powder as a physic, one-third of an even teaspoonful, in the morning or very late at night. As a moderate laxative, one-half this quantity every six hours; or less may be given in combination with a tonic, as in Spiced Bitters. Instead of the powder, the fluid extract may be given in syrup or in the Neutralizing Cordial. A solid extract, made into pills with powdered soap, is a good form for using it. *Apocynin* is a resinoid and concentrated preparation. Half a grain to two grains are a dose. It may be combined with leptandrin; or made into a pill with leptandrin and a little soap.

BITTERSWEET, *False Bittersweet, Staff Vine*. (*Celastrus scandens*.)—A climbing shrub in open woods, with a stem one inch or more in diameter twining around the trunks and branches of trees. Flowers small; the fruit a beautiful orange-red berry, nearly three cornered, with a scarlet aril around it, making a bright show upon the plant through the winter. The root is long and woody, half an inch or more in diameter, covered with a thick orange-red bark, which is the part used in medicine. It is a valuable alterative of the slow and relaxing class, best used with articles of the tonic class, as yellow parilla, stillingia, yellow dock, etc. It acts effectively on all the glands, including the kidneys; and is soothing to the general nervous system. A valuable alterative in scrofula, scrofulous ulcers, glandular swellings, tetter and other scaly diseases of the skin, etc. A wash is good in the same class of skin diseases. An ointment, made by gently heating for several hours eight ounces of the bark in half a pound of lard, is useful in burns and all irritable sores; and is particularly soothing to inflamed piles. Age and heat impair its properties. In syrup, four ounces of this with six ounces each yellow dock and burdock, and two ounces of yellow parilla, would be a good proportion for half a gallon.

BLACKBERRY, *Dewberry*. (*Rubus*)—Both the high and low blackberry are astringent, the roots being used for chronic dysentery and diarrhea, to arrest hemorrhages, and for the usual purposes of other astringents. They are of strong action and somewhat tonic, not being intensely drying to the mucous membranes. As a wash in sore mouth and bleeding gums they are good; and may be com-

bined with allspice and bayberry in excessive menstruation. The fruit is one of the most wholesome of the berries, grateful to weak and irritable stomachs, and of service in diarrhea and laxity of the bowels in summer. When the stomach and bowels are irritable, the berries should be crushed and strained so as to remove the seeds.

Blackberry Cordial is an admirable article for summer diarrheas with colic. It is made in many ways, but the following method is a superior one: Gently heat any desired quantity of berries till they begin to swell and break; then mash them thoroughly, and strain through a flannel bag with hard pressure. For each pint of this juice take a quarter of an ounce each of allspice, ginger and cinnamon; and a few grains of mace and cloves; crush them well, tie them in a piece of muslin, immerse them in the berry juice, and heat them gently for an hour or more, keeping the vessel covered. Remove the spices and press them out well; and to each pint of the juice add a pound and a quarter of pure granulated sugar and dissolve at a low heat. Put in small bottles well corked, and it will keep without the usual objectionable method of adding liquor.

BLACK COHOSH, *Rattle Root, Squaw Root*. (*Cimicifuga Racemosa*)—A graceful annual, three to four feet high, with a long plume of little white flowers in June and July. Its dark, short, hard root is medicinal. It is of peculiar service in some neuralgias and other nervous and spinal affections; in rheumatism, both outwardly and inwardly; in promoting the menses and relieving painful menstruation. Its uses are spoken of in the several diseases, especially in St. Vitus' dance, rheumatism, meningitis, snake bites and coughs. It is a fine relaxing and soothing expectorant, possessed of much power; and should be given only in small doses, as from three to five grains of the powder every four or six hours; or an infusion of half an ounce in a half pint of tepid (never boiling) water, steeped for half an hour, and a tablespoonful of this every two hours. Too large doses leave the brain rather deficient of blood, and create an unpleasant dizzy feeling. In cough syrups, half an ounce or less with a proper amount of the other agents is usually enough to two quarts. A tincture of four ounces to a pint of diluted alcohol is often used in warm water to dissipate the alcohol, giving a fourth of a teaspoonful or less every three or two hours. The tincture is also a useful liniment in rheumatism.

Cimicifugin, also called *Macrotin*, is a concentrated preparation of the black cohosh, and is used instead of the powdered article, but is not so reliable. Its dose is about half a grain to a grain every six or four hours. This form is probably most suitable in meningitis, while the infusion is best for St. Vitus' dance.

BLACK ROOT, *Culver's Physic, Tall Speedwell.* (*Leptandra Virginica.*)—An annual plant with a perennial root, one to several erect stems rising four to seven feet high; and on the top of each stem one or more spikes, several inches long, crowded with small white flowers. At intervals of six or eight inches up the stems the long narrow leaves are arranged in whorls of four or more. The root is several inches long, about half an inch thick, nearly black outside and a light brown inside.

Black root is peculiarly an American remedy, which has been in extensive use among progressive physicians for a century, but only within a few years has it been even partially known among those who exclude all new information till all the rest of the world has learned it. This root is one of the most valuable and reliable remedies; and Dr. Culver, who introduced it, did a glorious thing for men. It is reliable for its action on the liver, gently and steadily increasing the secretion of bile. An ordinary dose requires about ten to twelve hours to show its full effects, and then probably continues to act mildly twelve hours more. This slowness and gentleness make it invaluable as a hepatic in the multitude of fever and other acute cases where a steady and mild action on the liver is demanded. Its effect is relaxing, hence in many cases it needs a small quantity of golden seal or gentian with it as a tonic; and in depressed conditions, as typhus fever and low bilious fever, half a grain of cayenne should be added. It scarcely acts upon the gall-ducts or the bowels, and secures movements of the bowels by increasing the flow of bile; on which account, when used as a distinct physic, it should be combined with agents that are more actively cathartic, as bitter root and mandrake. The Compound Leptandrin Pill is an excellent form for such combination. Not acting on the gall-ducts, it is not a suitable article for true jaundice, although so reliable for other forms of biliousness. One full dose in twenty-four hours, and this preferably at bedtime, is generally best; but in dysentery, fever, and other acute cases, a small dose every twelve hours is best. It should not be used for old and debilitated people.

BLACK SALVE.—Heat three pints of olive oil carefully, and melt in it three ounces each rosin and beeswax; then gradually add two pounds and a quarter of powdered red lead. Sift in the lead a little at a time, and stir constantly with a paddle of hard wood. Gradually the mixture will become black-brown, from the oil and lead mingling and uniting chemically, precisely as oil and potash unite chemically in the formation of soap. When this has been effected, the salve, while still quite hot, should be poured into small-sized boxes. One pound of red lead with two quarts of linseed oil makes a similar preparation; but the mingling of the ingredients chemically is more difficult to accomplish, and I do not think it so desirable an article. Some add half an ounce of camphor gum, but to my mind this is objectionable.

Black salve, when well made, has no free red-lead in it, and therefore is not poisonous as might be supposed. It is an excellent stimulating article for burns, and for old and indolent ulcers. It should be spread very thin, merely a film in many cases; for if too thick, its stimulating power is too great, making it very "drawing." It must not be used if "proud flesh" appear.

BLUE COHOSH, Papoose Root. (*Caulophyllum*.)—Blue cohosh root is a stimulating nervine, useful in spasmodic affections, cramp, colic, hysteria, neuralgia, and similar troubles. It is especially active upon the womb in painful and deficient menstruation, tardy labor, leucorrhea, etc. A moderate amount of it is generally used with less stimulating articles, as in the Mother's Cordial. Half an ounce of it in a pint of boiling water makes a good infusion; of which one to two tablespoonsful may be given every three hours, but in spasms may be given every fifteen to thirty minutes. *Caulophyllin* is a concentrated preparation, which acts mostly upon the womb; and is given in doses of half a grain to a grain three or four times a day.

BLUE FLAG. (*Iris Versicolor*.)—Blue flag root is a moderately slow cathartic, acting without griping and producing rather thin stools, causing nausea in large doses and leaving a relaxant impression. As a physic, the dose of the powdered root is from fifteen to twenty grains, repeated every twelve to twenty-four hours and usually combined with a little ginger. But its greatest value is as an alterative for scrofula and impurities of the blood; as it acts upon all the secreting and excreting organs, and in small doses

gets a mild action of the liver, gall-ducts, bowels, kidneys and the glands generally. For such uses it is mostly combined with yellow dock, burdock, and other alteratives, a quart of syrup containing about one ounce of blue flag. A resinous preparation—*Iridin*—is made from it; of which one-fourth to a half a grain three times a day is alterative and gently laxative, and two to four grains cathartic. It is mostly combined with jalap and mandrake for cathartic purposes.

BONESET, *Thoroughwort.* (Eupatorium Perfoliatum.)—A familiar and bitter family remedy, used in cold infusion or syrup for tonic purposes; warm infusion to promote sweating and vomiting. Boneset has a decided yet slow action on the gall-ducts and upper bowels, aiding in the discharge of bile and in evacuations of the alvine canal. On these accounts it is most useful as a tonic in bilious cases with a tendency to constipation, in jaundice and malarial fevers. It is peculiarly serviceable in bilious fever, used freely in warm infusion to cause vomiting and sweating; and during the intermission given cold as a tonic and antiperiodic. Its extreme bitterness is a great objection to its use, except when moderate quantities of it are combined with other tonics in syrup form. A solid extract of boneset is sometimes used as a basis for such powders as bitter root or mandrake in making pills.

BORAX.—This familiar article is chiefly used for washes, either alone or combined with such other agents as may be needed. It is very cleansing; and a little of it in water will act well as a detergent in washing the skin or the scalp when soap is objectionable, as in some of the scaly diseases of the surface. One ounce of borax will dissolve in about a pint of cold water; but this is much too strong for common use, and such a solution is diluted to any desired point. Being quite antiseptic and also soothing in its action, it makes a good wash for cleansing unhealthy sores; and a few grains of borax in infusion of sage, cherry bark, raspberry leaves, kino, or golden seal, forms a favorite wash for thrush and sore throat. Five to ten grains in an ounce of water make a good wash for inflamed eyes. Twenty to thirty grains in an ounce of vaseline is a good ointment for tetter and other irritable skin diseases where lard is not advisable.

BREAD OF LIFE.—Mix, in finest powders, two ounces licorice root; one ounce poplar and cherry barks, ginger and cinnamon;

half an ounce golden seal, and one-fourth of an ounce cloves. Into two pounds of powdered sugar rub thoroughly twenty drops oil of peppermint, and half a pound powdered gum arabic. Now mix the powders and this prepared sugar together thoroughly; and then form it into a stiff dough by gradually adding and mixing in a thick mucilage from elm bark steeped a few hours in cold water. Four ounces of powdered elm bark may be used instead of the gum arabic. Roll this dough into thin sheets, cut into small lozenges, and dry them well.

Small portions of these lozenges may be eaten in dyspepsia, faint feelings at the stomach, hoarseness, low grades of sore throat, etc. It is much valued.

BUCHU. (Barosma or Diosma Crenata.)—Buchu leaves come from southern Africa. They have a strong but not unpleasant odor. An infusion of a drachm in a gill of boiling water is used in congestion of the bladder with mucous discharges in the urine, aching through the bladder, and scanty urine. Dose of the infusion, a tablespoonful every three or four hours; of the fluid extract, ten to twenty drops in water or syrups. It is a very strong agent, of a stimulating grade of action, and is best added to other articles, as one-tenth part of it with queen of meadow.

BUGLE WEED, *Water Horchound*. (*Lycopus Virginicus*.)—This plant is soothing to the nerves and mildly astringent to the mucous surfaces. It is of value in allaying irritable and spasmodic cough, especially when the expectoration is too abundant; and is of much service for those troubled with bleeding from the lungs, gums, bowels, kidneys or other organs. Also useful in excessive discharges of urine, incontinence of urine, and night sweats. Its mildness of action is much in its favor; and it leaves an improved tone to the organs. An infusion of an ounce to the pint may be given in doses of a tablespoonful or more four to eight times a day; or the fluid extract given in doses of ten to twenty drops. It is generally combined with other agents.

BURDOCK. (*Lappa Major*, *Arctium Lappa*.)—Roots of burdock are well known as a mild alterant or blood purifier, chiefly acting on the skin and to a more moderate degree on the kidneys and bowels. They are much used for scrofula, and for dry and scaly skin diseases; being usually combined with more stimulating and toning remedies, as yellow parilla or stillingia. A strong decoction

may be drank freely, and in this form is a popular remedy for boils. In syrup form, three pounds to a gallon would be suitable; but two parts of burdock with one part yellow dock and half a part parilla represent its more suitable use,—two pounds of the mixture to a gallon of syrup. Burdock seeds, used freely by infusion, act on the kidneys and bladder, increasing the urine and soothing irritation.

BUTTERNUT, *White Walnut*. (*Juglans Cinerea*.)—In medicine, the inner bark of the trunk and root of the butternut tree is used. It is a moderately prompt physic, emptying the gall-bladder and the lower bowel, resembling rhubarb somewhat but leaving no astringency or tendency to constipation. While mild in action it is very reliable; and has over most cathartics the advantage of leaving a toned condition to the walls of the bowels, which makes it peculiarly valuable in habitual constipation, prolapse of the bowel, and many other cases. As a physic in ague and other malarial diseases, in jaundice, general biliousness and piles, and dropsy, it is one of the most useful. A syrup, made of a pound of bark boiled in several waters till its strength is exhausted, then evaporated to a pint and two pounds of sugar added, is an efficient preparation,—one to three teaspoonsful usually acting in six or eight hours. A small portion of ginger or a few drops of peppermint essence make it more pleasant to use. A *Compound Syrup of Butternut* is made with one pound butternut and half a pound of wahoo to half a gallon of syrup, and is an admirable preparation, which I have used many years. Butternut is also combined with senna, when a quicker action is desired. The fluid extract may be used; or the solid extract made into pills, and two or more taken at bedtime.

CAMPHOR. (*Laurus Camphora*.)—Gum camphor is obtained from an evergreen tree of Japan, China and the East Indies. Minute portions of it exist in some other plants. Soluble in strong alcohol, about two ounces to the pint, (*Spirits of Camphor*.) Its inward use is scarcely recommended. Outwardly its use is very popular, with many, in liniments to allay muscular soreness; and in combination with various essential oils in liniments. It dissolves in warm lard or sweet oil, making *Camphorated Oil*, which is used outwardly for bruises, sore muscles, sprains, etc. Spirit of camphor is much used to dry up the milk after weaning a child; but it half-

paralyzes the breasts, causes considerable wasting of them, and renders them ever after small and inefficient. A similar effect is often noticed when used in liniments for rheumatism, where it lessens the natural lubrication of the joints and may thus endanger their suppleness. Half a teaspoonful or more of the spirit, given every two hours or oftener in water, is a lauded Homeopathic remedy in cholera; but I would place little reliance on it, though small doses (as a few drops) will diminish the secretions of the bowels under some circumstances.

CANADA SNAKE Root, *Coltsfoot, Wild Ginger.* (Asarum.)—Coltsfoot snake-root, as this is also called, is a peculiar aromatic stimulant. Used for arousing the circulation in colds, chilliness, colic, etc. It is generally employed in infusion, a limited amount of it being added to white root, catnip, and similar mild agents.

CARAWAY. (Carum Carui.)—Among the aromatic carminative medicines, caraway seeds are of the best, though some persons do not like their flavor. Used mostly in colic; and added to bitter tonics to cover their taste, and to some sharp physics to prevent their griping. The oil is principally employed, a drop or two being given on sugar; or a few drops of the essence of caraway added to water and sugar, and used in colics.

CASCARA SAGRADA, *Sacred Bark.* (California Buckthorn.)—A very bitter article, acting slowly and mildly upon the liver and bowels. It is of value in chronic constipation with torpid liver, one-tenth part or more of its fluid extract added to a mild tonic or alterative preparation being a good mode of using it. In doses of half a drachm to a drachm it is gently laxative.

CASTOR OIL. (Ricinus.)—Were it not for its unpleasant taste and smell, and its stickiness to the mouth, castor oil would be the most desirable of physics in a large variety of cases. It acts, usually, in four or five hours; and effectually dislodges hardened faeces, viscid mucus and acrid accumulations, without causing watery discharges or griping. Its mildness fits it for use whenever a prompt cathartic is needed, as in acute dysentery and diarrhea, recent colds, colic, temporary constipation, the constipation of pregnancy, etc. For children, it is one of the best physics when it can be given; but it is very objectionable to most persons, and some stomachs cannot overcome their repugnance to it. Its taste may, in a

measure, be concealed by mixing it with warm milk and a few drops of essence of peppermint or fennel. If the nerves of taste are fully occupied by first taking a peppermint lozenge or some essence into the mouth, the oil may then be given in warm milk or warm coffee without being noticed at all unless by the smell. It may be made into an emulsion with yolk of egg and sugar, and then essence of peppermint and water added. The ordinary dose for an adult is a large tablespoonful or a little more; and for a child of two or three years, somewhat less than half that amount. Mixed with a strong mucilage of elm or gum, two to four tablespoonsful may be given by injection, and will promptly unload hardened faeces from the lower bowel.

CATHARTICS, *Physics*.—Medicines that procure movements of the bowels act on different parts of the structures, and also in various periods of time. Some especially secure an increased secretion of bile, as black root; and others promote this action and also the emptying of the gall-bladder and ducts, among which are wahoo, berberry, blue flag, and others. These are called *Hepatics*; they act moderately on the bowels themselves, but procure discharges chiefly because of the flow of bile; and usually improve digestion. Most hepatics are rather slow in action, and are best used in chronic constipation and biliousness.

Other cathartics act principally on the bowels, among the milder of which are castor oil, sweet oil, rhubarb, magnesia, butter-nut; of the more active are senna, jalap, bitter root, and these are often spoken of as *Physics*, in distinction to the slower hepatics. Some physics are chemical salts, and are called *Saline Cathartics*; the principal of which are Epsom salts, Glauber salts, Rochelle salts and citrate of magnesia. These act quickly, and in large measure by procuring a watery flow into the bowels, whence they are said to “cool the blood;” and they are suited only to temporary use when prompt movement is needed, and are not suited for frequent repetition nor for thin persons with a cool surface.

The especial class of physics best adapted for particular cases, is directed in the chapters on different diseases. It is exceedingly important to keep the entire course of the bowels and liver steadily free, to prevent the many discomforts and dangers arising from the presence of offensive materials in them, and to prevent the absorption of these materials into the blood. Such an open state of the system is also necessary to promote the cure of the secondary

troubles which arise as consequences of their obstruction, as indigestion, piles, dropsy, and other severe difficulties which often depend on a torpid liver and habitual constipation. By freeing the alvine canal, the entire circulation and round of secretions are also many times set free; as is often noticed in some fevers, where sweating, a free flow of urine and quiet sleep are not procurable till after the liver and bowels have been evacuated suitably. So important are these facts, that it has become a popular belief that most of the ills of life are curable by physic; and so we find many people continuously taking active purges and completely exhausting the bowels by them, without correcting their daily habits or using proper medicines for other purposes. Such use of sharp cathartics is an outrage on Nature, and cannot fail to do a wrong to the system, as has been pointed out in Chapter II.

CATNIP, *Catmint*. (*Nepeta Cataria*.)—As a soothing and pleasant nervine, this article has much value. Its use in the colic of children is well known; and it is equally useful for adults in colic, restlessness, nervous irritability, a common drink in fevers; etc. Because of its use for children it is otherwise despised, but should not be. Warm infusion is the best mode of using it, the water being poured on boiling hot, the vessel covered to prevent the loss of its volatile properties, and strained off in ten minutes. Prolonged heat or boiling ruins it. It makes a fine nervine fomentation for painful swellings, over the abdomen in dysentery, etc.

CAYENNE PEPPER, *Red Pepper*. (*Capsicum*.)—No more powerful or reliable stimulant is known to medicine,—the small African pods being strongest, but our home-grown long or round pods being excellent. It acts upon the entire circulation, arousing and increasing the force of the flow; most of which power is expended on the arteries, from the heart outward. Its action is not so rapid as that of ginger and some other stimulants, but is much more prolonged; hence it is usually combined with the more speedy agents to fortify them and continue in stronger form the action they start. It may be used in any case where strong stimulation is desired, as in sudden colds and chills, congestive chill, sinking, collapse, failing circulation, and all similar conditions. Whenever an organ is congested and torpid, a *very little* may be added to the agents used for that organ, as in liver pills, tonics for low dyspepsia, etc. Outwardly it acts in the same way, and is of great value.

in liniments, washes, and other applications over inward congestions and suffering, (as in dysentery, colic, pneumonia, etc.); in chronic rheumatism (but not in acute), neuralgia, sciatica, lumbago, paralysis, and many similar troubles. For such purposes it may be combined variously, as in Stimulating Liniment and Nervine Liniment; and added to gargles in deep throat congestion, putrid sore throat, loss of voice, etc. It is one of the most powerful arrestors of gangrene and mortification, especially combined with myrrh; or added to salt and vinegar as a gargle in diphtheria and scarlatina.

In powder, a grain is about the bulk of a small grain of wheat, and from one-quarter to one-half a grain is a limited dose, one grain to two grains being a full dose, but larger quantities being sometimes used in emergencies. If employed in powder, it should be mixed in syrup or mucilage. Given by infusion, its great strength allows but ten to fifteen grains in a pint; and a smaller portion is sufficient in most combinations, as in the Composition Powder. When used in syrups, the proportion of five grains of capsicum to the pint will be ample. For outward uses, a tincture may be made of an ounce and a half of cayenne, a pint and a half of alcohol, and a half pint of water. If needed, this tincture may be given inwardly,—a few drops added to a tablespoonful of water. Vinegar extracts the strength of red pepper moderately well, and makes a good preparation for outward use and for gargles. Capsicum plasters are now kept on sale, similar to mustard leaves; and are powerful when a strong and continuous action of cayenne is desired outwardly, as in rheumatism and sciatica, or over the chest in advanced pneumonia, applied for half an hour at a time.

CHALK.—Chalk is a native carbonate of lime, another form of which is marble. Freed from its impurities by mixing with large quantities of water and letting the coarse particles settle, it is called *Prepared Chalk*; and in this form is usually employed. It is a mild alkali, given to correct acidity of the stomach and bowels in diarrhea, also in acid forms of dyspepsia; and frequently is applied to burns and irritated ulcers, being then mixed with linseed or other oil. It does not dissolve; but an eighth to a fourth of a teaspoonful may be given every three or two hours, in water or syrup. *Chalk mixture* contains half an ounce of chalk and a quarter of an ounce of powdered gum arabic in an ounce of syrup and seven ounces of cinnamon water. It is useful in diarrhea, a teaspoonful to a tablespoonful every two hours.

CHAMOMILE. (*Anthemis*.)—For centuries the flowers of chamomile (or camomile) have been used in medicine as one of the most grateful of the mild tonics, gently promoting appetite and digestion, and sustaining the nervous system while soothing it. They are useful in all forms of feeble digestion, and during convalescence from fever and other acute diseases. A moderately strong infusion, given cold, is best for these purposes; while a warm infusion promotes sweating and will aid in giving an emetic, in which respects they resemble boneset but are not so unpleasantly bitter. Boiling water drives off a volatile oil from them, and greatly weakens their action as a tonic; but the steam of this water may be inhaled to much advantage in quinsy and other acute soreness of the throat. Chamomile exerts a quite decided influence in increasing the menstrual flow; for which purpose a cold and strong preparation may be used with perfect safety when the menses are persistently scanty, and a warm infusion used liberally in suppression or painfulness from cold. On account of this action, it is not a suitable tonic for a recent mother, except the flow natural to such occasions becomes suddenly deficient.

CHARCOAL, *Carbon*.—Wood charcoal in fine powder is used to absorb gases and to arrest putrefaction. It is used inwardly in dyspepsia with foul breath and eructations, pains in the stomach from indigestion, water-brash, and the nausea and vomiting of these conditions. Half to a whole teaspoonful may be given an hour or less after meals. It is sometimes mingled with dough and baked into flat biscuit, using about 20 per cent. of charcoal; and these charcoal biscuit eaten with or after the meals. It gives relief, but does not cure dyspepsia. I prefer to give two or three grains of charcoal and half a grain of gum myrrh, in a capsule; and if the myrrh is too exciting to the stomach, I use hydrastia instead. It makes a good poultice to fœtid ulcers and gangrenous sores,—one part of charcoal with two parts each bread crumb and flaxseed meal, changed frequently. To be effective, it should be fresh; and if old, should be heated nearly to the red point before using.

CHERRY, *Wild Cherry*. (*Prunus*).—Bark of wild cherry is a mild and soothing tonic, with moderate astringent powers. It is used chiefly in weak and irritable stomach and bowels, with indigestion and diarrhea; and may be added to neutralizing cordial, or combined with a little bayberry and golden seal. For indigestion,

it is a good companion to smaller quantities of stronger tonics. It is an admirable soothing agent to strengthen the lungs in irritable and prolonged coughs, especially if the expectoration is too free; when it is generally combined with spikenard, comfrey, a trifle of elecampane, and similar agents. Is a good basis for snuffs in moist catarrh, and gargles for sore throat; and in poultices for irritable and scrofulous ulcers. Heat destroys its soothing properties, hence it should never be boiled, as tepid water extracts all its virtues. Six ounces of crushed bark steeped in a pint of water for a day and then carefully strained, may be made into a syrup with a pound and three-quarters of sugar dissolved by shaking, and then two ounces of glycerine added. Fluid extract of any desired article may be added to this.

CHESTNUT leaves, made into a strong syrup, are a good anti-spasmodic in whooping-cough, and may be given quite freely. They are good with other articles in irritable coughs.

CLEAVERS, *Goose Grass, Bed-straw.* (Galium.)—Several varieties of this four-angled, jointed and half-trailing plant are used. All of them act gently on the kidneys and bladder, and are well suited to inflammation of these organs with scalding urine, and as a drink in ordinary fevers. A pint of tepid water will take the strength from a small handful of the bruised herb; and this may be used cold, three or four tablespoonsful every two hours. Fluid extract of cleavers can be used with syrups.

CLOVER BLOSSOMS.—The flower-heads of the common red clover of our meadows are a good alterative with gently laxative properties. A strong decoction of them may be made by boiling, and drank freely; or a syrup, at the rate of two pounds to the gallon, may be given in doses of a tablespoonful four times a day. Combined with yellow dock and smaller quantities of yellow parilla, they will be found valuable.

CLOVES are the most stimulating of all the spices, and are to be used in much smaller quantities than the others in any spice mixtures. Outwardly they enter into the Spiced Bag; but I am not partial to their use inwardly, for they are too heating and driving to the stomach unless used in very limited portions. Both the cloves and their oil are popular in toothache, but I have found them hurtful to the enamel.

COLD CREAM.—Under this name a very elegant and soothing ointment is prepared, which is also called Ointment of Rose Water. Various methods are employed, the following being the best: I. At a gentle heat melt together five ounces almond oil, and one ounce each spermaceti and white wax. Add to these three ounces of rose water, a little at a time,—stirring briskly and constantly till cold, and continuing to stir till it forms a uniform creamy mass. II. Dissolve a drachm and a half of borax in an ounce of glycerine, add six ounces of rose water and heat it nearly to the boiling point. In a porcelain vessel put eleven ounces of almond oil, four ounces each spermaceti and white wax, and melt at a low heat. When this cools enough to begin to stiffen, add slowly the above borax preparation, stir it constantly till cold and smooth, toward the last adding fifteen drops attar of rose. This is superior.

COLD POWDER.—Mix four parts asclepidin, and one part each caulophyllin, cypripedin and Greek valerian; rub the mixture thoroughly with an equal bulk of powdered sugar. Half an even teaspoonful of this mixture added to a teacupful of warm ginger tea makes an excellent preparation for recent colds and slight feverishness. A tablespoonful or more of the infusion may be given every hour. If there is some cough, use it in flaxseed tea with a little ginger.

COLOMBA, (or Calumba.)—A foreign root; and one of the bitterest and best of tonics to invigorate the stomach, improve appetite and digestion, give tone to a debilitated system, and strengthen the alimentary canal. Most stomachs receive it very kindly, even when other tonics are not accepted. It is suited to convalescence in most acute diseases; and may be combined with ginger, lady slipper, or other tonics. In powder, five to ten grains may be given before or after each meal. Fresh infusion, an even teaspoonful or less to a small teacup of boiling water, is a better form for its use; a tablespoonful at meals. An American columba is similar to the foreign, but not more than one-fourth as strong.

COMFREY. (Symphytum.)—Root of comfrey is a popular article in cough syrups, and well deserves its reputation. It is demulcent and soothing, allaying irritation, slightly increasing expectoration, and leaving the air-passages gently toned. It is mostly employed with spikenard and similar agents in syrup form, for coughs; and is useful with mild tonics in female weakness and chronic diarrhea.

COMPOSITION POWDER.—Dr. Samuel Thomson's formula for his famous composition powder was: Two pounds of bayberry, one pound each hemlock bark and ginger, two ounces each cayenne and cloves. It is a powerful stimulating and astringing preparation, a teaspoonful to a half pint or more of boiling water making an admirable infusion for sudden chills, fainting, shock, collapse, snake bites, the beginning of colds and pneumonia, flooding, profuse menses, severe colic, watery diarrhea, and in giving a stimulating emetic. It is unsurpassed for promptness and power in arousing the whole system; re-establishing a flagging circulation, arresting gangrene, and otherwise checking serious depressions. From one to four tablespoonsful may be given as needed, or large quantities may be drank in emergencies. The ingredients tinctured make a very convenient form for it.

But Thomson's composition is much too stimulating for numerous cases where a preparation of the kind is needed; so many years ago I devised the following formula, which is now officinal, and is the one alluded to in this book except when Thomson's is especially alluded to: Bayberry, white root and ginger, each one pound; prickly ash bark, four ounces; cayenne pepper, half an ounce. It is used in the same conditions as the other, but in a larger range of cases and is more sweating. Two teaspoonsful to a half pint of boiling water make the usual infusion.

CENTRATED PREPARATIONS.—Various agents have made from them either a resinoid powder, or an extract in powdered form. Among these are asclepidin, apocynin, cimicifugin, cypripedin, dioscorein, hydrastia, leptandrin, and many others which are named at the proper places. An ounce of such a preparation represents the strength of a pound or more of the crude medicines; and this makes a great convenience in giving the article in powdered form, the dose being so very small. In some of the concentrations—as asclepidin, cypripedin, dioscorein, caulophyllin—the preparation may be rubbed thoroughly with ten times its bulk of sugar or the sugar of milk (lactin), and then boiling water will make a desirable infusion, using an eighth of a teaspoonful of the concentration to a cup of water.

CRAMP BARK, *High Cranberry*. (*Viburnum Opulus*.)—The inner bark of this pretty shrub is an admirable nervine tonic, of the class that especially relieves spasms. It is excellent in female

cramps and neuralgias, hysteria, crampings in the limbs and during pregnancy; in colics and for spasmodic coughs. It is usually added in moderate quantities to other articles suited to the case, as with dioscorea and ginger for colic, spikenard and cherry for coughs, etc. It is an ingredient of the Mother's Cordial. In such combinations, one to two ounces in a quart of syrup is enough of this agent.

CREAM OF TARTAR.—As a slightly acid and cooling drink in fevers, this article is popular. For this purpose, one-third of an even teaspoonful may be put in a glass of cold water and sweetened, and one or more tablespoonsful used occasionally. It increases the flow of urine and gently opens the bowels. A stronger acidulated drink may be made with a quarter of an ounce of the tartar, two ounces of sugar, a pint and a half of boiling water, and a little fresh lemon peel. In doses of a teaspoonful mixed in syrup, it acts as a gentle cathartic; but is rarely given for this purpose, though commonly about ten grains are added to jalap or the anti-bilious physic to hasten the action of the latter.

DANDELION. (*Taraxacum.*)—Dandelion acts gently on the liver and kidneys, and is useful in chronic liver torpor with its accompanying indigestion and sluggishness of the bowels. It is also combined with tonics and used in dropsy. It is mild and slow in action, and slightly tonic. The roots should be gathered in August and September, as they are possessed of most active properties. It may be used in decoction, an ounce being boiled in a pint of water for ten minutes, strained, and two or three tablespoonsful given three or four times a day. Its fluid extract may be added to syrup; or a syrup may be prepared from it with two pounds of the dried or three pounds of fresh root to a gallon.

DEVIL'S BIT, *Gay Feather, Button Snake Root, (Liatris.)*—Several varieties of this plant are used, being similar in properties. They are rather active and stimulating, hurrying the circulation, increasing the flow of urine, promoting the menses, and sustaining the nervous system in hysteria and painful menstruation. An ounce boiled a few minutes in a pint of water makes a decoction of which one to three tablespoonsful may be given every three hours or oftener. Used in large quantities every few minutes, it is of efficacy in snake bites. It may be added to other articles in syrups, two ounces to the gallon, to give them a fair stimulating action.

DIOSCOREA, *Colic Root, Wild Yam*.—A nervine of the anti-spasmodic class, gently stimulating and tonic. It is most valuable in colic, used with ginger or angelica, or a little added to the neutralizing cordial. With equal parts of lady slipper and blue cohosh, it is an admirable mixture for nervousness, nervous headache, hysteria, cramp in the stomach, etc. An even teaspoonful is sufficient for a teacupful of infusion; and one or two tablespoonsful may be given at intervals ranging from half an hour to several hours, as needed. In fluid extract, the dose is from twenty drops to a teaspoonful. *Dioscorein*, its concentrated preparation, may be given in doses of one to four grains; or rubbed with sugar or lactin and made into an infusion, using from five to fifteen grains of the dioscorein to a cup of water.

DOGWOOD. (*Cornus*).—Both the bark and the flowers of this tree are medicinal, being tonics of a pleasant character. The bark is rather astringent, and proves somewhat stimulating to the pulse. It is used as the other moderate tonics, and by some is valued in ague and other intermittents as an anti-periodic. It may be given as an infusion, or in fluid extract, much as columba is used though not so strong as the columba. Dogwood flowers are somewhat stronger than camomile flowers, and are very acceptable to a weak stomach. Ripe dogwood berries are also a good tonic. Few plants serve a better purpose for strengthening the stomach and bowels, correcting the diarrhea of indigestion, diminishing excessive menstruation, etc.

DWARF ELDER. (*Aralia Hispida*).—A small woody plant about two feet high, beset with stiff bristles, with bunches of round black berries. Its root has a somewhat pungent odor, and is stimulating to the kidneys, acting slightly on the bowels. For torpid kidneys and scanty urine it is an excellent remedy; and also for dropsy. An ounce to a pint of boiling water makes a decoction that may be given every three or four hours, two to four tablespoonsful at a dose. Generally it is added to tonics and hepatics, about four ounces in a gallon of syrup, to maintain suitable tone and action of the kidneys. Of its fluid extract, half to a whole teaspoonful may be given three or four times a day.

EFFECTUATING DRAUGHT.—Dissolve twenty-five grains of tarteric acid in a tumbler one-third full of water, and thirty grains of bicarbonate of soda in another tumbler. A little syrup of gin-

ger or lemon may be added to the first tumbler. On pouring the two waters together brisk effervescence takes place and forms an agreeable drink in malarial fevers and irritable stomach, cooling and slightly laxative. The powders are usually prepared in papers of different colors, and are known as *soda powders*.

Another similar draught may be made by mixing a tablespoonful each of lemon juice and water, and to this add two tablespoonsful of water in which ten grains of potassium carbonate (not bicarbonate) have been dissolved. Drink while effervescent. Should it not effervesce, add half as much more lemon juice, and stir it. This is really a better draught than the former. Yet another may be made with vinegar and bicarbonate of soda; but care should be taken that the vinegar rather than the soda is in excess.

ELDER. (*Sambucus*.)—Elder flowers make a pleasant drink in malarial fevers, and act gently on the skin and kidneys. Added to such alteratives as yellow dock and stillingia, they help to promote the secretions. The bark is less pleasant; and half an ounce of it in a gill of boiling water will act as a cathartic. It may be added to alteratives in syrup form. A better use is to make an ointment of it by macerating half a pound of the bark in half a pound of lard and two ounces of mutton suet (or tallow) at a low heat for four hours; this ointment being very soothing and healing. An excellent cordial can be made by using elder berries instead of blackberries, and is useful for the same purposes as blackberry cordial.

ELECAMPANE. (*Inula*.)—This root is popular in cough syrups, being stimulating and increasing expectoration. It is best added in limited proportions to comfrey, cherry and spikenard, and made into a syrup,—two ounces of elecampane to the gallon being usually enough. It loses most of its properties by boiling. Combined with camomile it increases the menses, but is seldom used outside of cough syrups.

ELM, Slippery Elm. (*Ulmus*.)—Bark of slippery elm abounds in mucilage and demulcent properties. It is best used by adding cold water to the whole bark; and the infusion thus obtained may be given in irritable and inflamed stomach, bowels, kidney and bladder; in dysentery, scalding urine, recent coughs with inflamed throat, etc. Like other mucilages, the stomach will tire of it if the infusion is too thick and the quantities taken are too large. Its powder

is a good basis for poultices, to which any desired remedies may be added; but a little oil, lard or glycerine should be mingled with it to keep the poultices from becoming dry and harsh.

EMETICS.—Emetics are of incalculable value in many difficulties,—unpleasant to take and by some used indiscriminately and to excess; but at times imperatively necessary to avert danger and to save life. If poison has been taken and is yet in the stomach, an emetic in the quickest possible manner is demanded. If there is undigested and fermenting food in the stomach, provoking distress and fever; or viscid mucus clinging to the walls and so enveloping the food that the gastric juice cannot reach it, as in chronic dyspepsia; or such a dormant condition that the gastric juice and other secretions in the stomach appear scarcely to leave the mouths of the glands, an occasional emetic is almost marvellous in its benefits. Besides dislodging the offending contents of the stomach, and by the amount of fluids drank thoroughly washing the smaller particles from out of the folds of this organ,—which is impossible without the use of those fluids,—an emetic forces all tenacious bile from the gall bladder and the remotest ducts of the liver; starts perspiration and clears out the sweat glands; empties every large and small secreting organ of waste materials that have accumulated in them, and then is followed by increased discharges of urine, and usually by most desirable evacuations from the bowels; relieves the veins from burdens that made the general circulation of blood sluggish; and takes from the general nervous system the weight of depression that was loading it down. Thus an emetic, properly given, is far-reaching in its good influences, making on the entire frame a vigorous impression that is at the time a sort of physiological revolution. Such effects must then be followed up by suitable remedies to the organs that have been so suddenly relieved,—stomach, liver, bowels, skin, kidneys, according to their several needs. This medication is to be more or less tonic and stimulating, according to the degree of sluggishness and depression that existed before the emetic was given.

Some obstinate cases of malarial diseases, dysentery, liver troubles, and other maladies, seem to resist all treatment until an emetic has been given, when at once they begin to improve and danger is averted. The repetition of emetics is not to be determined by the wonderful relief experienced after the vomiting, but by the evidences of a return of the obstructions and oppressions

that first made their use advisable. In the more acute cases, one is usually sufficient and accomplishes all that is desired from this act; in chronic cases, others may be required at intervals of many days or weeks. But the repetition of emetics every few days till a dozen or two of them have been given, is the sheerest folly; and brings a most powerful measure of relief into disrepute, and confuses the judgment as to the conditions when an emetic is really necessary.

The act of vomiting consists in the sudden contraction of the muscles of the stomach, and of the muscles of the chest and abdomen in such a manner as to press on the stomach from all sides and to press out its contents. If the stomach is sensitive, vomiting may be excited by a few copious draughts of warm water, camomile tea, boneset tea, lobelia infusion or tincture, salt and warm water, flour mixed into a thin paste with water, alum syrup, etc. If the stomach is depressed from the presence of narcotic poisons (opium, morphia, belladonna, etc.,) such articles only relax it the more, favor the absorption and more rapid spread of the poison through the system, and should never be given. Such conditions demand the most vigorous and sudden stimulation possible, as has been directed in the section on poisons. If the stomach is languid and oppressed, loaded with viscid mucus as shown by the state of the tongue, and the system below the average in its functional activities, more or less stimulation will be needed to induce vomiting, with astringents to consolidate the mucus that it may the more effectually be detached from the surface of the stomach and dislodged. In such conditions, some tact is required to procure vomiting; and the course to be pursued may be described under the following heads:

I. *Ordinary Emetic.*—Make a moderately strong tea of the composition powder, keep it quite warm, and at intervals of ten to fifteen minutes give half a teacupful or more four times. Have ready a very large teaspoonful of powdered lobelia herb steeped in a coffee-cup of boiling water; and in ten minutes after the last draught of composition tea pour off this lobelia infusion and give it at one draught. If it incline to provoke immediate vomiting, let this be resisted so the lobelia may have opportunity to relax the organs; then in ten minutes renew the use of the composition, and give it freely every five or eight minutes till free vomiting occurs. Immediately after vomiting give a large drink of this, so that the stomach shall have fluid in it when renewed efforts at vom-

iting occur, otherwise the contractions will cause much distress. Before the system will rest, there may be two or three such acts at intervals of fifteen or twenty minutes; and if there is nausea or languor without vomiting, give freely of the composition till emesis is again excited. Some persons will go to sleep, and vomit when they awaken. If the stomach is quite sour, the action of lobelia will be quite ineffectual; and in half an hour or so after giving it, dissolve a fourth of a teaspoonful of cooking soda in half a teacup of the hot composition tea and give it quickly. It is not necessary nor advisable to give any more lobelia, if the first portion has been retained ten or more minutes; for that only causes the greater relaxation and delays the vomiting. After the lobelia, success depends on using plenty of the composition, and finally the soda once. This method is the one suitable to the majority of cases.

II. *Stimulating Emetic.*—In cases of great sluggishness of the system, as in chronic ague and some other lingering troubles, the officinal composition is not strong enough in its stimulating properties. Relaxation of the tissues is already great, and the lobelia will but relax them the more and no vomiting may be obtained. In such cases it is much better to use Thomson's formula of composition; or else to add an additional part each of bayberry and cayenne to the other composition. And the infusion would better be used in portions of about one-quarter of a teacupful every fifteen minutes for two hours before giving the lobelia; and then in larger quantities till it operates. By this course the entire system is completely aroused and left stimulated. A small portion of golden seal may be added to the composition after the lobelia has been given, and leaves an excellent tonic impression on the venous circulation.

III. *Nervine Emetic.*—When the nervous system is much disturbed and acutely excited in recent cases, and an emetic is needed by the condition of the stomach, it will be best not to use the composition except there be added to it as much lady slipper or dioscorea as there is ginger. In most of such cases, no cayenne whatever is needed; but a suitable tea may be made of equal parts ginger, dioscorea and geranium, and one-fourth part bay-berry. Instead of then giving the lobelia in one large draught, the amount above directed may be given in three portions ten minutes apart, the last portion being given in half a cup of the tea. By this course the entire nervous system will be left much soothed and quieted, and not materially relaxed.

IV. *Emetic by the Bowel*.—At different places in this volume it has been stated that certain depressions of the nerves and the circulation make it very difficult to give the usual form of emetic, though the stomach and liver may greatly need it, and in such cases it may be given by the bowel. This is done by using small quantities of the tea named for the nervine emetic, continuing it steadily every half hour; and after several hours giving an injection of a heaping teaspoonful of lobelia in extremely thin starch water. Vomiting will be light; but the lobelia may be repeated a second or even a third time at intervals of three hours, and offending materials thus be loosened and cast out.

EPSOM SALT. (Magnesium Sulphate).—In doses of an ounce, or about a heaping tablespoonful in water, this saline cathartic operates mildly in three to four hours, producing thin stools. It is a reliable physic of its class; suitable in feverishness when the bowels need to be opened quickly; not suited to thin people nor in chilly states, nor adapted to frequent repetition in habitual costiveness. It is most acceptable when given in soda water (or an effervescent draught) with lemon syrup.

ESSENCES. SPIRITS.—Alcohol dissolves the essential oils obtained from a number of aromatic plants by distillation, and these solutions are called essences or spirits. Among the most common of these are anise, cinnamon, cloves, caraway, cummin, dill, fennel, peppermint, spearmint, wintergreen, juniper, origanum, sassafras and rosemary. *The usual proportion is one part of oil to nine parts alcohol, but some require only half that, and wintergreen requires but one of oil to thirty of alcohol. Essences are mostly used for flatulent colic; and are given in water and sugar, or added to other medicines, as ginger, angelica, dioscorea, or catnip. They are also added to some stimulating physicks, in syrup (or the oil in pills) to prevent griping; and to bitter articles to disguise their taste. One ounce of gum camphor in a little more than half a pint of strong alcohol and two ounces of water makes the *spirits of camphor*.

EXPECTORANTS.—Agents that increase the secretions of the air passages are called expectorants, and are used in cough preparations. Some of them are very mild and soothing, as sugar, honey, flaxseed, mallows, slippery elm, licorice; and are best suited to acute cases, and feverishness with dryness and tickling in

the passages. Others are much more active, as lobelia, black cohosh, and Greek valerian among the relaxants; blue cohosh, elecampane and tolu among the stimulants. Limited portions of these agents are generally added to others of less expectorant and more balsamic character acting on the lungs, as to comfrey, spike-nard, etc.

EXTRACTS.—When the entire strength of a vegetable remedy is obtained by boiling water, or by cold water and alcohol, and this is evaporated in shallow vessels till it becomes solid, this solid is called an *extract*. Such preparations are often used in making pills, being for this purpose mixed with various cathartic or tonic powders. Very many remedies are now treated with alcohol and water and a little glycerine, and then evaporated until a pound of fluid contains the strength of a pound of the medicinae. These are called *Fluid Extracts*, and are a very convenient class of preparations, especially to make syrups with. One ounce of any fluid extract, or combination of them, added to three ounces of syrup of ginger, or to simple syrup flavored as desired, is the usual proportion. All fluid extracts give some deposit when added to water or syrup, which is not always palatable; yet they are much used because so convenient. This deposit is greatest with poorly made fluid extracts.

FEVERFEW. (Pyrethrum).—This plant is cultivated in our gardens for its beautiful white flowers, which resemble the camomile in appearance and in medical properties. It is not so pleasant as camomile, being more bitter and a stronger tonic; but is equally good in the same cases.

FIGWORT. (Scrophularia).—As a stimulating alterative, the herb figwort is much valued by many in scrofula, glandular swellings, old ulcers, etc. It is best added in limited proportions to such articles as burdock and bittersweet. A variety called *carpenter's square* is more serviceable in deficient and painful menstruation, but they are used indiscriminately.

FLAXSEED. LINSEED.—Flaxseed is one of the best demulcents. An infusion is made by steeping half an ounce (or an even tablespoonful) of the whole seed in a pint of hot water for an hour, adding about a quarter of an ounce of licorice root, straining and sweetening. It is admirable for recent colds, tickling coughs,

acute dysentery, and inflamed bladder and kidneys, and may be used freely. For colds, add two tablespoons of lemon juice, or some vinegar. Boiling extracts some of the oil, and makes an infusion not pleasant for the stomach but admirable for injections. Flaxseed meal is one of the best demulcent poultices.

GENTIAN. (*Gentiana*.)—Gentian of the shops comes from Europe; but there are a number of species common to our fields, all having similar properties though not so powerful as the foreign. Its root is an intensely bitter tonic, used in languor of the stomach, dyspepsia, and sluggishness of the gall-ducts with biliousness. As a stomachic it is too strong to give alone, or to continue long; and is best added in quite small portions to mild tonics like camomile or cherry bark, with orange peel and coriander seeds or ginger. A dose of its powder may be from one to three grains, three times a day. It is a good addition to tonics like boneset and wahoo in agues; and I have repeatedly broken up persistent chills with a teaspoonful of its fluid extract and a grain of cayenne, given in a syrup or in neutralizing cordial. A pill of its solid extract, with a grain of salicin and half a grain of cayenne in each pill, is a good antiperiodic in old agues. It slowly aids the discharge of bile.

GERANIUM, *Cranesbill, Crowfoot, Alum Root.* (*Geranium Maculatum*.)—A slender plant with pale purple flowers an inch in diameter, growing in open woods. Its root is one of the stronger astringents, pleasant to use and very effective. Given inwardly, in moderate quantities, in profuse menstruation, spitting of blood, and other hemorrhages; used locally and as a wash in leucorrhea, sore mouth, mercurial salivation, and other excessive mucous discharges; and admirable as a local application in spongy gums, drooping palate, bleeding from the nose or teeth, etc.

GINGER. (*Zingiber*.)—Ginger is one of our most valuable and pleasant stimulants, quick and diffusive in action, directing the flow of blood promptly to the surface and promoting perspiration. Jamaica ginger is much stronger than the African, and is the article always meant in this volume. Its warming taste and action are well known; and it is admirably fitted for sudden chilliness, colds, catarrhal fever, colic, and all cases of shock, prostration, and flagging circulation. It is an excellent adjunct to tonics, cathartics, diaphoretics, and other remedies where a gentle stimulating action is desired. For most purposes it is best given by infusion and

used warm,—a heaping teaspoonful or more, as desired, to the pint of boiling water; and given in small or large quantities as needed. A *tincture* or *essence* of ginger is prepared by macerating four ounces of the bruised root in a pint of alcohol for a week, and filtering. This is convenient to use by adding any desired quantity to twenty or more times its amount of warm or cold water, thus avoiding the delay of preparing an infusion. It is one of the articles that should always be at hand for emergencies. When it is desired to add a little ginger to any syrup, this tincture may be used,—a teaspoonful to the pint being a fair proportion. *Syrup* of ginger may be made by adding a little more than half an ounce of the tincture to a pint of simple syrup; and this is commonly used when the fluid extracts are to be prepared in syrup form. Ginger is an important ingredient in composition powder.

GLAUBER SALT. (Sodium Sulphate.)—One of the saline cathartics, the dose being a tablespoonful in several tablespoonsful of water. It operates in four or five hours, its general action and uses resembling Epsom salts. It is more unpleasant to the taste than Epsom salt, the bitterness being partly disguised by a little lemon juice, vinegar or cream of tartar.

GLYCERINE is a good solvent for most drugs, and one part of it with three parts of water will answer in place of alcohol in making tinctures, and will keep them equally as well as alcohol. Internally it is slightly loosening to the bowels, and promotes expectoration when used in cough syrups. It is mostly employed externally in various skin diseases, (which see), diluted with water and bay rum for chapped hands, and in ointments and poultices.

GOLDEN SEAL, *Yellow Puccoon*. (*Hydrastis Canadensis*).—For thirty-seven years I have used this article in my practice, and repeatedly have described its admirable properties in my books and journal. It has been in use among progressive physicians for a century. Within ten years, an eastern physician has borrowed from my writings an account of its action, palmed it off as a recent discovery of his own and made himself famous thereby. And yet he does not understand more than one-fourth of its qualities, and nearly always nullifies its virtues by combining it with the poisonous bromides or some other deleterious article. It is thus that some physicians decry every improvement, and abuse those who would make progress; and then, after leaving their patients for

years to suffer without the benefits of knowledge, take up the new things long after they have become old with others, pass them off as *their* discoveries, and cover their folly by continuing to abuse those who taught them! It is discreditable to any man or any organization of men, thus to stand in the way of science and delay its progress.

Golden seal root is one of the most admirable of tonics, particularly influencing the mucous membranes everywhere. It improves appetite and digestion, having no equal for such purposes in weak and debilitated conditions of the stomach, and in the many nervous disturbances caused by indigestion. It meets chronic congested states of the stomach much better than any other tonic, being neither stimulating to the arteries nor astringent to the mucous glands; and in ulcers of the stomach is often the only tonic that can be borne. For such conditions it may be combined variously, as with lady slipper and scullcap when nervous symptoms predominate; with balmony and cayenne (see Spiced Bitters) when sensibility and circulation are dormant; with an excess of cherry bark and white poplar when indigestion inclines to looseness of the bowels; with a soluble preparation of iron (see Iron) when intestinal digestion is imperfect; with myrrh in diluted preparations when the stomach is ulcerated or suffers the peculiar irritation preceding ulcers; with Neutralizing Cordial in diarrhea and cholera morbus, etc. It is also a very suitable tonic to add in small portions to alterative syrups and preparations for female troubles; and as it unquestionably acts on the gall-bladder and gall-ducts, it is the best tonic to use with medicines for torpid liver and jaundice.

For local applications, it is admirable in congestion and chronic inflammation of the eyes, sore mouth and throat, leucorrhea and most vaginal ulcers, congestion and catarrh of the bladder, and all similar maladies affecting mucous membranes. It is equally reliable, either in poultice or ointment or wash or with glycerine, in many difficulties on the surface,—eczema, deep-colored erysipelas, slow-healing abscesses, indolent and scrofulous ulcers, etc. About fifteen years ago I discovered that this article is sustaining to the right side of the heart, and to the tissue in the veins everywhere, as cayenne is stimulating to the left side of the heart and to all arteries. This particular line of action makes golden seal invaluable in various heart diseases, in the later days of pneumonia, in enlarged and weakened veins; in all congestions, as during agues, in "ague cake," chronic liver congestion, etc. It also explains

why it is so reliable when the tissues are becoming dusky-red in erysipelas and about sores; in dropsy, puffy eyelids with congestion, in typhus and other congestive fevers, and many other troubles where it has long been used. This action upon heart and veins I fully described in a pamphlet published in 1866; and it places the golden seal as a peculiar remedy and one without a peer.

Dose of the powder, two to ten or more grains every three to six hours. It is oftenest used in fluid extract added to syrups; or a fourth or less with other suitable articles by infusion.

Hydrastia sulphate and *hydrastia phosphate* are concentrated preparations of golden seal, much used instead of other forms of the article. They are soluble to the extent of about one grain to an ounce of water; and may be added to syrups, or used in water alone. Dose from one-fourth of a grain to a grain, as required; or a larger amount if used in agues with salicin or other antiperiodic. This is the most desirable form to use it for eye-washes, as it will not sour for a long time; and is the best form for using it with the soluble preparations of iron. Hydrastia will alter its properties and mold, if used with a vegetable astringent; but may be used with alum.

GUAIACUM, *Lignum Vitæ*.—Guaiacum wood is a resinous article of decidedly stimulating powers. A decoction is made by boiling an ounce of the chips in a pint and a half of water down to a pint; and this may be used in broken doses during twenty-four hours for rheumatism, as an alterant, and to promote perspiration. Only a very small portion of its properties is yielded to water, and the medicine has no doubt been over-rated; yet a little of it makes a useful stimulant addition to alterative syrups. Its *resin* may be rubbed to a powder, and given in doses of five to ten or more grains three or four times a day; or it may be tinctured and used in this form, but its resin separates and floats when the tincture is added to water.

GUM ARABIC.—This is the purest of the mucilages or demulcents. Dissolved in water, a fourth of a teaspoonful to a large tea-cup of cold water, it may be given in small portions as a drink in any inflamed condition of the mouth, throat, stomach or bowels; also in inflamed lungs, kidneys and bladder. A small lump of it may be held in the mouth and dissolved slowly. It is much used in making lozenges and pills, but pills containing it get too hard.

As a true *gum*, it dissolves in water but not in alcohol; while many articles called gums—as myrrh, hemlock, olibanum, guaiacum, and others—are resins rather than gums, and dissolve in alcohol but not in water.

HEMLOCK, Hemlock Spruce. (*Pinus Canadensis*.)—Inner bark of hemlock is one of the strong astringents, usable when an article of that grade is needed, (see Astringents.) It is an ingredient in Thomson's Composition. Hemlock *leaves* may be used in warm infusion to secure free perspiration and break up a cold; or the vapor from them, in a vapor bath or by hot fomentations, used in sub-acute and chronic rheumatism, sprains, colds, menstruation obstructed by cold, etc. But the *oil* contained in the leaves is mostly employed with origanum and other oils in liniments for rheumatism and sprains, being a strong stimulant. The hemlock *gum (resin)* is used alone or variously combined in plasters, making a slow and useful stimulant application over the back in torpid kidneys, chronic rheumatism, etc. For such purposes it may be combined with an equal amount of resin, and softened with a fourth part of beeswax.

HOLLYHOCK. (*Althea Rosea*.)—Hollyhock belongs to the mal-lows family, and is similarly demulcent. Its flowers may be used for this purpose in recent colds; and especially in inflamed bladder, scalding urine, the suffering caused by gravel, in acute dysentery, and similar troubles. It is best used by infusion. Outwardly it may be employed in poultices.

HONEY is more stimulating than sugar and acts somewhat upon the bowels. While not employed for merely sweetening purposes, it is an excellent article to use with sage and borax for thrush, and in almost any gargle. Under the chapter on inflamed eyes I have spoken of a peculiar and very valuable use of it.

HOPS are tonic and nervine; sometimes spoken of as narcotic, but I have never seen any narcotic action from them. Half an ounce in a pint of boiling water makes an infusion that allays nervous irritability, promotes sleep, and improves digestion somewhat. One to three tablespoonsful of this may be given every two hours. Fluid extract of hops, in doses of five to ten drops, is more tonic than nervine, and may be added to any syrup. A pillow of hops is an old-time and a good article to favor sleep.

HOREHOUND, *Hoarhound*. (*Marrubium*)—A warm infusion of hoarhound is a family remedy for recent colds, used freely. In syrups it is often added in moderate portions to other articles for coughs and chronic catarrhs, having the property of stimulating the air-passages somewhat while diminishing excessive secretion. Compound hoarhound syrup is described elsewhere. A strong decoction is used with sugar and gum in various hoarhound candies.

HORSERADISH, in its fresh state, is not used as medicine, and is too harsh an article for healthy stomachs to take. When dried, it loses most of its acrid properties; but is a good stimulant to combine in limited quantities with barberry, juniper berries and golden seal for very sluggish cases of jaundice, dropsy, etc. Such a combination is often steeped in cider vinegar and sweetened.

INFUSION.—An infusion is generally made by steeping an article in warm water without boiling. When the agent has no volatile properties that will be injured by heat, the water may be poured on boiling, the vessel covered and then allowed to stand near a fire for half an hour or longer and strained. If heat will injure its properties,—as cherry bark, catnip, mints, black cohosh, peach leaves, elecampane and others,—the water should not be boiling when poured on, and it should be set in a cool place to steep for one or two hours. A bruised or sliced article is best to make an infusion, being most easily strained and not liable to adulteration. Most powders are now liable to be adulterated with corn meal, flour, or other substance. In making an infusion with a powdered drug, first mix it into a thin paste with cold water, and then pour on the boiling water stirring constantly. By this method lumpiness will be prevented. Usually an ounce or two tablespoonsful of powder or bruised drug is employed to rather less than a pint of water; but bulky herbs will need more of the remedy, while compact and strong articles—as golden seal, columba, cayenne—will need much less.

If desired for fever or other acute diseases, infusions should be given tepid or warm; and in small doses at intervals ranging usually from half an hour to two hours, according to the urgency of the case and the effect required. If for sweating purposes, the dose should be large, at intervals of half an hour till perspiration starts, the patient being in a warmed room and well covered in bed. For less acute conditions, an infusion is given cold, at periods of from

two to four hours. Although infusions are bulky in dosage, no form of giving a medicine will so promptly and effectually secure the entire action of the drug.

Infusions of the concentrated preparations (see p. 657) are now made; and this is an excellent plan with many remedies in acute cases, the dose being much smaller than infusions made directly from the drug.

INJECTION, ENEMA, CLYSTER.—Injections are given to the bowel either to secure an evacuation, to aid the action of a cathartic that has been given some hours before (see *Antibilious Physic*), or to obtain the general effects of medicines instead of giving these by the stomach. Injections are also given to the vagina to remove tenacious discharges, to cure ulcers, and for other purposes; but these do not belong to this volume to discuss, but have been detailed in my *WOMAN'S BOOK OF HEALTH*. Injections should be given lukewarm.

When it is desired to evacuate the lower bowel, about a pint of fluid should be used for an adult. This may be variously medicated, among the more suitable cathartic injections being: One to two tablespoonsful of brown sugar; the same or a larger quantity of molasses; a teaspoonful or more of table salt, to which sugar or molasses may be added; an eighth of an even teaspoonful of ginger, alone or with sugar; infusion of boneset, especially in habitual constipation; infusion of catnip, for colic as well as costiveness; infusion (strong) of boneset and senna, with salt and a very little ginger, when a decided impression is required and in bilious colic. Other combinations might be mentioned, but these will suffice. It is often desirable to use one-fourth milk and three-fourths water in such injections. Have an enema retained from twenty to thirty minutes, that the contents of the bowel may be softened; and if the evacuation does not then seem to be effectual, repeat it in about an hour. Soapy water is often used for this class of enemas; but its repetition is likely to become irritating, and in children is usually objectionable.

Nervine and antispasmodic remedies are those mostly given by the bowel for general effects. Among these may be mentioned lobelia, lady slipper, asafoetida, black cohosh, blue cohosh, dioscorea, catnip, etc. Powerful impressions may be made in this way through the entire nervous system, emetics may thus be given, and benefits of the greatest importance obtained in many acute

maladies,—as in locked-jaw, apoplexy, meningitis, typhus fever, dysentery, diarrhea, and many others. Sometimes the stomach cannot receive enough medicine to ease acute suffering or to save life; and enemas, regularly repeated, then become indispensable. In sudden and severe depression, shock and collapse, the decided stimulants may be used in this way till reaction has been obtained (p. 611); but so soon as the sensibilities of the system have been aroused, the bowel will expel stimulants forcibly. To procure the remedial action of drugs in this way, the bulk of the enema should be from two to three ounces (or about half a small teacupful) for an adult; and it is generally best to use the medicine in powdered form mixed with thin starch water, or elm water, or carrageen. About three times as much powder will be required by injection as would be needed by the stomach. A very strong decoction may be used if the powdered article is not at hand. Such injections should be retained, by placing a compress firmly against the anus if necessary. Nervines should be repeated about every three hours; stimulants like composition, blue cohosh and ginger, cayenne, etc., may be repeated every hour till reaction starts.

Nourishment may be given by enema, and in no small number of cases is absolutely demanded. This will be more fully spoken of in another place as Rectal Alimentation.

IRISH MOSS. *Carrageen*.—Demulcent and nutritious, this article is at once food and medicine. It is mostly used in bronchial and lung troubles with irritation and soreness, in dysentery, and the summer diarrhea of children. Steep half an ounce of it in cold water for ten minutes, and pour off the water; then boil in a pint and a half of water down to a pint, strain, add a little lemon juice and sweeten. It may be used freely. It is much more nourishing if milk is used instead of water.

IRON. (Ferrum).—Many vegetables are violent poisons, dangerous to life in very small quantities. Most minerals, and compounds of minerals, are poisonous,—some mild, others powerful. But the great majority of vegetables are harmless and sanitary; and some minerals and mineral compounds are equally so. Each article must be judged by itself, and not by the kingdom or family it belongs to. Deadly nightshade and poisonous tobacco belong to the same botanical family as the fiery cayenne, the succulent tomato and the starchy potato. Table salt is made up of the corroding

metal sodium and the suffocative gas chlorine. Chemical union alters the characters of both articles; and chemistry changes the properties of all articles,—making some dangerous elements into harmless compounds, while others retain their dangerous qualities. Hence it is by no means wise to conclude that all minerals and their compounds are poisons, or that all vegetables are innocent.

Some of the preparations of iron are mildly poisonous, others are violently so. All such I reject at once and totally. They are: Arseniate of iron, tincture (chloride) of iron, iodide of iron, phosphate of iron, sulphate of iron (copperas), and others. But some of its preparations are sanitive and may be used to advantage,—not so particularly to supply iron to the blood, the total amount of this metal in a man being but a few grains; but chiefly because they improve intestinal digestion, (p. 125) and in that way increase the amount of healthy blood in the system. No iron preparation should ever be used with a vegetable astringent, as a coarse ink is formed when they come together. The following are the most usable preparations; in addition to which many spring waters (chalybeate springs) contain iron in useful forms:

Citrate of Iron, and Tartrate of Iron and Potassium. These are soluble in water. Half an ounce of the citrate will dissolve in an ounce of water, and more of the tartrate. I generally put half an even teaspoonful or less in half a pint of water or syrup; and to this add four grains of hydrastis sulphate; which makes an excellent tonic in cases of poor digestion with rumblings of the bowels, anaemic conditions, and a tendency to costiveness.

Carbonate of Iron is a reddish powder, used sometimes in pills, but liable to accumulate in the bowels. A *Saccharated Carbonate* is in grayish-brown masses, and makes one of the best iron preparations for pills,—two to four grains being given three times a day. *Reduced Iron* is a gray (never a black) powder, and the best of the powder forms; three to five grains three times a day.

Hydrated Oxide of Iron is a pulpy mass used only as an antidote to arsenic (p. 617). *Solution of Iron* is a fluid of the strongest styptic powers, used only to arrest hemorrhage.

JALAP.—An active stimulating physic, usually griping, producing thin stools. Dose, one-third to one-half a teaspoonful, which operates in from four to six hours. It is seldom given alone, being too harsh; but is a valuable companion to senna in the Anti-bilious Physic.

JUNIPER.—Berries of juniper are diuretic of the stimulating class, arousing the kidneys to increased action. It is best to add them to milder diuretics, as queen-of-meadow. An ounce of the bruised berries in a pint of boiling water makes an infusion, all of which may be used in twenty-four hours; but one-third that quantity with half an ounce queen-of-meadow will make a more serviceable infusion, for it is unwise to force the kidneys. A fluid extract is prepared, its dose being about half a teaspoonful in water or syrup every four hours; or it may be added to alterative and tonic syrups when such a tonic is needed.

KINO.—Kino is the dried juice of an African tree. It is commonly called a gum; but differs from gum Arabic in being largely soluble in both water and alcohol. A strong astringent, reducing mucous discharges and checking the flow of blood as other astringents. It is also tonic, not drying mucous surfaces too greatly but giving them strength. It may be used in diarrhea when there is no inflammation, for which purpose a little of its infusion may be added to the Neutralizing Cordial or the chalk mixture. By consolidating flabby tissues, it is of great value in elongated palate and oedema of the glottis; and may be added to tonics in very lax conditions of the stomach, passive bleeding from the bowels, etc. Half a teacupful of boiling water on less than an even teaspoonful of the drug makes an infusion, to be strained when cold, sweetened if desired, and one to four teaspoonsful given every three or four hours for diarrhea.

LADY SLIPPER, *Nerve Root, American Valerian.* (*Cypripedium.*)—As a soothing nervine and antispasmodic, moderately relaxing and almost without stimulating properties, the root of this plant is one of the most valuable known to man. It relieves pain, restlessness, nervousness, neuralgia, cramps, wakefulness and the entire range of nerve irritations; and does it in a sanitive manner, not having any narcotic properties whatever, but leaving the nervous system quieted and slightly toned. Its action is slow but persistent; and may be employed in either acute or chronic maladies. In headache, the restlessness of fevers, colic, and all similar forms of suffering, it is a reliable aid to other treatment; and also in painful menstruation, after-pains, spinal tenderness, hysteria, and numberless similar conditions. From the predominance of relaxing properties, it is usually best to combine it with a moderate amount

of some more stimulating nervine, as blue cohosh or dioscorea, or with such a tonic nervine as scullcap. It may also be added to Neutralizing Cordial, Spiced Bitters and other preparations, when its particular action is needed in such company. Thus its range of usefulness, whether alone or in combination, is very wide; and Dr. S. Thomson, who introduced this admirable remedy to medical practice, deserves undying praise for that if he had never done another worthy thing for the healing art.

Dose in powder, five to twenty grains every two or three hours. An infusion of half an ounce to half a pint of water, (not kept too hot, for heat injures it), may be given in tablespoonful doses or more every two hours or hour. As an injection in starch water it is highly valuable in dysentery, colic, acute meningitis, hysteria, etc.; and a heaping teaspoonful of the powder may be used every three or four hours. *Cypripedin* is its concentrated preparation, of which the dose is from one to three grains two to four hours apart; or ten to fifteen grains rubbed well with sugar make half a teacup of infusion.

LAVENDER. (*Lavandula.*)—Lavender flowers are a pleasant aromatic, and sometimes are given by infusion for nervousness and nervous depression. *Oil* of lavender is an article in various liniments, being of a mild grade of stimulation. Half an ounce of this oil to a pint of alcohol makes essence of lavender. It enters into many compounds adapted to emergencies, one of which, *Compound Spirits of Lavender*, has long been in use and is made as follows: Lavender flowers two ounces and a half, rosemary leaves and cinnamon each a little less than an ounce, nutmeg a fourth of an even teaspoonful, three or four cloves; the whole tinctured in four ounces alcohol and twelve ounces of water. I prefer the following preparation of my own, which I term *Restorative*: Lavender flowers an ounce and a half; cinnamon, ginger, mace, anise seeds and motherwort, each half an ounce; tinctured as the above. It is an admirable article for faintness, heart palpitation, weakness from shock or fright, colic from cold, etc. Dose, one-fourth to half a teaspoonful, in warm water, as often as necessary. It is more acceptable to the stomach than the compound spirits.

LIME WATER.—Slack half an ounce of lime by the gradual addition of a pint of water, stir well and let it settle half an hour; pour off the liquid and throw it away, and to the residue add a

gallon of water. After the coarser particles have settled, pour the turbid liquid into a well-stoppered bottle. Undissolved lime will settle to the bottom, and thus keep the water of uniform strength. A pint of cold water dissolves only about ten grains of lime.

Lime water is a mild antacid (see Alkali), and slightly astringent. It is the most soothing of the alkalies in diarrhea, acidity of the stomach, and those forms of indigestion accompanied by irritability of the stomach, nausea and vomiting. It may be given in milk, and infants using milk may have from two to four teaspoonsful of it added to the amount taken at a meal, which will generally arrest any tendency to vomit the food or to diarrhea. An adult may take a tablespoonful in the same of milk an hour after meal. Like all alkalies, it relieves rather than cures; but may be continued longer than any other. Equal parts of lime water and cottonseed or flaxseed oil form a soapy mixture, which is of great value in recent burns.

LIQUORICE, *Licorice*.—So well-known are the properties of licorice that it seems almost needless to mention them. Its root is one of the best demulcents and nervines for the throat and air-passages in recent coughs and irritation of the throat, especially for the coughs often so annoying from persistent tickling at the root of the tongue. Either the root or its black extract may be used; but it is a relaxing article, and will partially nauseate the stomach if used too largely. It is generally combined with other articles, as in small portions with flaxseed infusion; in limited amounts in expectorant cough syrups; with cherry bark, black cohosh, small portions of lobelia, and similar articles in making cough lozenges. For tickling coughs with deficient expectoration I have been in the habit of using a syrup made of a teaspoonful each tincture black cohosh, tincture lobelia and tincture prickly ash, half a teaspoonful essence anise, ten drops essence peppermint, the bulk of a small bean black licorice, and simple syrup to fill a four-ounce vial. A few drops at a time and often will speedily relieve the throat irritation.

LOBELIA. (*Lobelia Inflata*.)—Lobelia is the most admirable of all the relaxants, acting promptly on all muscular fibres and mucous membranes; and, like all relaxants, being quite nauseating. In small doses it increases expectoration and the flow of saliva, gradually softens the pulse and hastens perspiration in high fevers,

making a useful addition in limited quantities to white root; soothes the nervous system and checks spasms, especially if added to lady slipper and some blue cohosh. In larger quantities, it is a reliable agent for spasmodyc croup and for asthma. In liniments, its tincture is excellent whenever a relaxing influence is required, as in the Nervine Liniment; and it has no superior in poultices for inflammations of any kind. For the purposes of an emetic, man is not acquainted with its equal; and marvellous indeed have been the results of using this article for such purposes, (see Emetics.) After millions upon millions of emetics with it have been given in a century by physicians and people, snatching thousands of lives from the grave, it is unworthy the authors of so useful a book as the U. S. Dispensatory to say that it should not be thought of for such purposes. That is merely "having eyes, yet seeing not;" for the world's experience cannot be shut out nor the progress of knowledge be stopped by such prejudice.

Lobelia has been much over-used, and often misapplied; but the assertion that it is a poison is simply ridiculous. Thousands of physicians have used it in enormous quantities in the hundred years since Dr. S. Thomson introduced it, yet it never has shown a poisonous property. By persisting in its free use, it will gradually so relax every muscle that the person cannot move a finger or an eye-lid. This is called the state of "alarm," in which lockjaw and even the dreaded hydrophobia yield to its curative powers; and such patients have been kept in this state for days together, and always recovered. No death will follow this "alarm," unless strychnine or other poison then be given. Let the patient alone, or give him small portions of composition, and he will come out of it. Dr. Thomson was once "tried" for killing a man with lobelia, and was treated as savages would scarcely treat a prisoner; but he was honorably discharged without so much as being put on his defence, for the prosecution made no case whatever against him. The people should understand the *facts* in all these matters.

The dose of lobelia varies greatly, according to needs. It is rarely given in powder; though one or two grains of the seeds may be given in capsule with as much cypripedin for slow relaxing and nervine purposes. An even teaspoonful in a cupful of boiling water is an average infusion, and one to several teaspoonsful of this may be given every hour or oftener. Its use in emetics is named elsewhere; but lobelia is not to be repeated if vomiting is expected, for it simply relaxes and thus prevents emesis. A very

weak infusion in small doses every few minutes is one of the best agents to stop hiccup and vomiting in many cases. Lobelia should not be used in depressions, unless combined with an excess of capsicum and other stimulants; and it is not at all suited to gangrenous or indolent sores.

MAGNESIA.—*Calcined Magnesia.*—Powdered magnesia is a mild alkali or antacid, and acts gently as a laxative in five to eight hours. It is of most service when there is a sour condition of the stomach and bowels, as in most diarrheas, the summer troubles of children, and when fermenting food is present. As a mild laxative in all such conditions it is excellent. Dose a tablespoonful or more, first rubbed with a little syrup and then thoroughly mixed with milk or with water. If it give no evidence of acting in four hours, a moderate draught of lemonade should be taken. *Citrate of Magnesia* is a fluid preparation with citric acid, and therefore is not alkaline nor antacid. It is one of the saline cathartics, agreeable to take and acceptable to the stomach, a small glassful acting as a mild laxative and a larger quantity as a full cathartic.

MAIDEN-HAIR. (*Adiantum.*)—This beautiful and delicate fern has some demulcent properties, and makes a pleasant and useful drink in fevers, recent colds, acute catarrh, etc.

MALLROWS.—Garden or high mallows, and the creeping low or cheese mallows, together with hollyhock flowers and the imported root of marsh-mallows, are all possessed of admirable demulcent properties. An infusion of any of them makes an agreeable demulcent drink in colds and bronchial irritations; and the low mallows of our door-yards is excellent for inflamed kidneys and bladder, as are hollyhock flowers. All of them may be used in poultices.

MANDRAKE, *May-apple*. (*Podophyllum Peltatum.*)—Mandrake root is one of the most positive cathartics,—moderately slow in action, but evacuating the gall-bladder and entire alvine canal freely. Its operation is very harsh in large doses; and it should be used only in sluggish conditions of the bowels, torpid liver, and similar conditions. It is much better to give quite a small portion of mandrake with such an article as black root, than to use the mandrake alone. Dose of the powder, one-fourth to half an even teaspoonful. *Podophyllin* is a resinous concentration from this

root, and is active in doses of a grain. It is rarely given alone, but combined with leptandrin and other less active articles in powder or pill, so that one-eighth of a grain or less of podophyl-lin shall be given.

MANNA.—A saccharine exudation from the bark of various foreign varieties of *Fraxinus*, manna is a mild laxative of a sweet taste that commends it to children. It operates in about four hours, occasionally griping somewhat, useful to unload the bowels and relieve piles, not appropriate to dyspeptic conditions. It may be given in substance, a child eating a drachm or two, an adult taking an ounce. Or it may be dissolved in hot water with a little peppermint or ginger. It is mostly employed with the saline cathartics (Epsom or Rochelle salt), or with senna and rhubarb. Its continued use is not desirable.

MARIGOLD. (*Calendula. Tagetes.*)—Marigold was a famed remedy centuries ago, and mythical properties were attributed to it as an antispasmodic, sudorific, and pretty much everything else. Its true place is as a mild stimulant with some astringent properties, to be used on bruises, sprains, etc. In such connections it is excellent, whether as tincture or ointment. It is also admirable to lessen excessive discharges from the ears, (p. 589.)

MARJORAM, Sweet Marjoram.—While mostly used as a condiment, an infusion of sweet marjoram is a pleasant drink in fevers and colds, and hastens the appearance of measles and other acute eruptions. It may be used with freedom; or combined with white root and ginger to promote sweating. (See Sweating Powder.)

MARSH ROSEMARY, Ink Root, Sea Lavender.—Root of marsh rosemary is one of the strong astringents with some tonic properties. It is mostly used for sore mouth, sore throat, bleeding piles, etc.

MEDICATED WATERS.—Essential or volatile oils (see *Origanum*) do not mix with water; but may be made to do so in a fair degree by either of the following methods: I. Pick open a drachm of washed cotton wool (cotton batting); add to it thirty drops of any essential oil, picking the cotton again so the oil shall get through it very evenly; then put this cotton firmly into a small funnel, and gradually add water till a quart passes through a drop at a time.

II. Drop thirty drops of the oil upon a drachm of carbonate magnesia, and rub till the two are thoroughly mixed; then add four ounces of water, a little at a time and rubbing thoroughly at each addition; and then add enough water to make a quart, and filter through paper. III. Put twenty drops of oil on an ounce of granulated sugar, and rub together thoroughly; then add four ounces of any syrup gradually, with rubbing; and finally pour this into syrup sufficient to make a quart. This last mode is the one employed when an oil is to be added to medicated syrups, as in Neutralizing Cordial, the amount of oil being varied from twenty drops downward for a quart, as desired. The first method may also be adopted when medicated syrups are to be flavored with an essential oil, using the syrups instead of water. When peppermint, spearmint, anise or any of these oils is to be used and the essence form is not desirable, either of these plans may be followed to mingle the oil with water, the last one being handiest for families. Gum camphor may be mingled with water by first dissolving two drachms in an ounce of alcohol, adding this to the cotton and letting the alcohol escape, and then passing through it a quart of water by the first method.

MOTHERWORT. (*Leonurus Cardiaca*).—Leaves of motherwort are an excellent tonic, mildly stimulating and of decided nervine properties. The remedy is good in nervous dyspepsia added to golden seal or other tonics; and especially strengthens the nervous system, increases the menses, relieves hysteria and neuralgia, and is of peculiar value in palpitation and nervous wakefulness. It is often given by warm infusion, half an ounce to a half pint of boiling water; one to four tablespoonsful every two hours for nervousness and deficient menstruation, or at meals for indigestion. More commonly, its fluid extract is combined with other remedies in the ratio of one-fourth of an ounce in a four-ounce mixture (see Extracts). In this way it may be associated with lady slipper and camomile for nervous irritability, or with scullcap and blue cohosh for nervous depression.

MOTHER'S CORDIAL.—Mix in the crushed form half a pound of squaw vine, and two ounces each cramp bark, blue cohosh and unicorn root. Macerate these for three days with equal parts of alcohol and water to cover them, and strain this off with pressure. Then use hot water to extract the strength as directed under the

title Syrups ; add this and the first liquid together, evaporate at a moderate heat till one quart remains, to which add four pounds of sugar and four ounces of glycerine and make into a syrup, which will contain no alcohol.

As a tonic for females this syrup is most excellent, strengthening the womb, relieving prolapsus and painful menstruation, abating leucorrhea, overcoming backache and general nervousness, and greatly improving the condition of the kidneys. During pregnancy it is peculiarly useful in strengthening the organs, allaying uterine cramps, and giving the structures the strength they will need during labor. If a more soothing nervine is desired, one drachm fluid extract of lady slipper may be added to each four ounces ; if more action of the kidneys, the same amount fluid extract queen-of-meadow. Dose two to three teaspoonsful three or four times a day.

MULLEIN. (*Verbascum*.)—Everybody knows mullein ; and they should also know that its great woolly leaves are an admirable medicine. Bruised and simmered in milk, they are excellent for looseness of the bowels and chronic diarrhea, and have a nervine power that allays the distress of such maladies. A strong infusion or a syrup of mullein is of much service in irritable coughs and spitting of blood, and deserves far more attention than it receives. Spikenard and comfrey may be combined with it for coughs. Its fluid extract is a fine nervine application for tender spine, sore muscles, painful swellings, etc.; and may be combined with tincture lobelia and a little essence origanum. Fomentations of bruised mullein leaves are almost invaluable for soreness in the chest, chronic abscesses, dropsical swellings, painful swellings and dropsy of joints, and many similar purposes. As they promote absorption, they should never be used on carbuncles or gangrenous places. An *oil* is obtained in small quantities from the flowers, and is of rare value for sore chest and irritable coughs of long standing.

MUSTARD.—Mustard is the most exciting of our stimulants, and is not to be used inwardly except in emergencies. In some cases of poisoning when a stimulating emetic of great promptness is demanded, it may be added to water—a teaspoonful to half a pint of warm water—and drank quickly, when it is likely to excite quick vomiting on tickling the throat with the finger. But its chief use is outwardly, either added in small quantities to hot

water for a local bath, or as a "mustard poultice" over the seat of sudden acute suffering. Its strong stimulating powers excite the surface, and thus divert the blood from inward parts that are acutely congested, or invite it from the head to other parts. It has the disadvantage of making the skin too tender to admit of its long continuance or of its early repetition, in which respects cayenne pepper is immeasurably better than mustard for prolonged outward application. If continued too long, it will cause blistering. It is usually made into a plaster by using one part of mustard to two or three parts wheat flour, and warm water sufficient to make a stiff paste. It is seldom desirable to have a mustard plaster of that strength; hence more flour should be added, and if the white of an egg and merely tepid water are used in mixing it, the action of the mustard will be greatly moderated. It is not often applied directly to the skin, but a very thin piece of muslin is interposed. It should be removed in half an hour to an hour, or as soon as the patient feels its smarting impression. *Mustard leaves* are a preparation of mustard spread upon paper and kept in drug stores. They are wetted and then applied, which is a convenience; but they are very sharp in action, and should not be continued beyond ten or fifteen minutes.

MYRRH.—Gum myrrh is chiefly a resin with but very little gum in it, (see Gum Arabic.) It is a stimulant of a somewhat balsamic character, and used in small quantities for deficient menstruation, for which it may be given with some form of iron, in pill. I frequently employ the following: Rub ten grains of myrrh powder in an ounce syrup of ginger, add two grains hydrastia sulphate and twenty grains tartrate iron and potassa; then three ounces of water. The myrrh is suspended in the fluid; and the compound, in doses of a teaspoonful four times a day, is a good tonic for relaxed stomach with water-brash and fermenting food, anaemia, poor intestinal digestion with bloated bowels, and deficient menstruation. One to two grains of powdered myrrh are usually enough for a dose, though ten times that amount are often advised. Given in capsule with a little charcoal and a tenth of a grain hydrastia, is a good plan. I sometimes rub five grains with an even teaspoonful of sugar, and then add five grains of golden seal and a fourth or a third of a teacupful of boiling water. This forms a weak infusion; and a teaspoonful every three or two hours is admirable for weak stomach and the repeated vomiting that occurs

in many malarial conditions. Myrrh should not be given when the stomach is inflamed, but only when depressed. It is a most powerful antiseptic, arresting the fermentation of food, and in minute portions suited to those ulcerous conditions of the stomach which tend to gangrenous destruction with foetid breath. As an outward application in gangrene, it has no superior.

Tincture of Myrrh is made by macerating two ounces of myrrh in coarse powder with a pint of alcohol for a week, frequently shaking. From a few drops to half a teaspoonful or more, added to water, may be used as needed for a stimulant and antiseptic. It may be used, diluted with glycerine and water, on foul and indolent sores, carbuncles, gangrenous erysipelas, spongy and bleeding gums, etc.

Compound Tincture of Myrrh, the famous "No. 6" of Dr. S. Thomson, is made by tincturing two ounces of myrrh and half an ounce of cayenne in a quart of alcohol for a week. It is a powerful stimulant and antiseptic, a few drops to half a teaspoonful in water being useful in sudden depression, collapse, shock, distress at the stomach with prostration, etc.; and may be repeated every half hour, hour, or as needed. It is used outwardly for foul and gangrenous conditions.

NERVINE LINIMENT.—Put into a pint each of water and strongest alcohol three ounces each of bruised lobelia herb and lady slipper root, and half an even teaspoonful of red pepper. Macerate for a week, and strain. This is an excellent outward application for sprains, bruises, aching muscles, rheumatism, inflamed bowels and other inward inflammations, etc. It is repeatedly advised in this volume, and is a representative nervine and mildly stimulating liniment. It may be used inwardly in spasms, stomach neuralgia, and similar disturbances,—half a teaspoonful or more in warm water as needed.

NERVINE TONIC.—Mix the coarse powders of two ounces each cherry bark and lady slipper; one ounce each Peruvian bark, scull-cap and coriander seeds; and an even teaspoonful each golden seal and cinnamon. This is a very desirable tonic for all ordinary forms of indigestion with flatulence and nervousness, during convalescence from most acute diseases, poor appetite, etc. An even dessert-spoonful to a teacup of boiling water makes a good infusion, which is altogether the better mode of using it,—a tablespoonful

or two before meals if the appetite is poor, after meals if appetite is good and digestion poor. In feeble convalescents, a tea-spoonful or two may be given every three hours. It may be tinctured on five parts water and one part alcohol,—the above quantities requiring half a gallon of this menstruum; but this is far from being as useful as the infusion, and I do not advise it.

NEUTRALIZING CORDIAL.—Mix the coarse powders of rhubarb root and bicarbonate soda each two ounces, peppermint herb four ounces, golden seal and cinnamon each half an ounce. An infusion may be made with a half a teacupful of boiling water on an even teaspoonful of the mixture, sweetened to taste, and used the same as the following syrup form.

Omit the peppermint herb, and upon the other ingredients as above put a pint and a quarter of hot water and, when cold, half a pint of alcohol; tincture for a week, and strain through cotton flannel. Add to the liquid two pounds of granulated sugar, and evaporate till a quart remains,—which dissipates the alcohol. Into four ounces of sugar rub thoroughly ten drops oil of peppermint and add to the syrup when cold, dissolving it by shaking.

Neutralizing cordial is one of the admirable antacid and tonic preparations for sour stomach, diarrhea from indigestion or acidity of the bowels, cholera morbus, flatulence and colic, and all similar disturbances of the bowels. It may be given in doses of half to a whole tablespoonful every three or two hours for diarrhea; a tea-spoonful or less every half hour or hour in cholera morbus. Two tablespoonsful repeated in two hours usually act as a mild laxative; and is most excellent to unload the bowels in the above cases. In the griping, green stools, “belly-ache” and similar disturbances of infancy and childhood, it has no equal,—a few drops to any desired quantity in water, according to the age of the child. (See Alkalies, and Rhubarb.)

NUTGALLS.—These are obtained from various species of foreign oak trees, being hard excrescences caused by the puncture of an insect in laying its eggs. They are among the most powerful of all the astringents.

OAK (Quercus.)—All the oaks are strongly astringent in their bark, the large red and white oaks possessing this property in the greatest abundance. Most of the tannin of commerce is now made from white oak bark, much of it being also made from nutgalls.

OINTMENTS are usually made on lard, which should be fresh and pure, and free from salt. It is best to give stiffness to the lard in most instances by adding one-fourth part of mutton tallow; or to a pound of lard add two ounces of mutton tallow and one ounce or more of white wax or spermaceti, melting them together at a moderate heat. Such a mixture makes a "simple ointment," which is an excellent dressing for light burns and healing sores. Mutton suet is far less likely than lard to become rancid, and a rancid fat is always poisonous and irritating; and this suet makes the very finest basis for an ointment, being softened to any desired degree by adding cotton-seed oil, or oil and a little glycerine—which preserves it a long time.

Simple ointment may be used as the basis for almost any medicine whose properties are desired in this form. The drug in very fine powder may be thoroughly rubbed into the lard or other basis,—one part of the drug to two or more of the unguent. In this way are prepared ointment of sulphur, wild cherry, lobelia, witchhazle, and other agents that would be injured by heat. When some heat is not destructive to the properties of the drug, an ointment of it may be made by mixing it in coarse form with the simple ointment, keeping at a moderate heat for two or three hours, and then straining. Ointments of bittersweet, yellow dock, elder, and many others are usually made in this way. Cold-cream ointment and compound bayberry ointment have been mentioned elsewhere. When an ointment is so stiffened with wax (either white wax or beeswax), or with this and spermaceti, as to be firm and not nearly so soft as lard, it is usually called a *cerate*.

Vaseline is, of itself, a soothing ointment; and it may be used instead of lard in making ointments, stiffened with some paraffine when necessary; but it does not promote the absorption of medicines so well as lard.

OPODELOD.—Slice into a broad-mouthed bottle three ounces of common hard soap, that contains no resin, and put on it a pint of alcohol. Place it where it will keep moderately heated, keeping the bottle closely corked. When the soap has dissolved, add an ounce of camphor gum and one drachm each oil of rosemary and origanum; and when these are dissolved, pour into broad-mouthed vials. When cold, this forms a soft jelly that readily melts with the warmth of the hand, and is much valued for sprains, bruises, sore muscles, etc.

ORIGANUM is a variety of the common marjoram, valued for an *essential* or *volatile oil* that it contains in large quantities. This oil, like others of the essential oils, is soluble in alcohol; and will dissolve in linseed and cottonseed oil; but will not dissolve in water except to an insignificant degree, but made more soluble in water by being rubbed with sugar or other substances, (see Medicated Waters.) Origanum oil is mostly used as a stimulant in liniments, as in the Stimulating Liniment, Opodeldoc, etc. For such purposes it is usually combined with other essential oils, among the more stimulating of which are oils of rosemary, thyme, hemlock, red cedar and sassafras. Oils of cajeput, savin and tansy are too harsh for use. The more aromatic essential oils are seldom used in liniments, but are given on sugar, or as essences or medicated waters. Of these the more useful are anise, peppermint, spearmint, wintergreen, cinnamon, lemon, juniper, caraway, pennyroyal, cloves.

PEACH.—Peach pits, or kernels, are strongly tonic to the stomach, and may be used with other tonics, but are too intense in their action on the stomach nerves to use alone. Peach leaves are peculiarly soothing to the kidneys and bladder, and are among the best remedies for inflammation and irritation of these parts. An infusion of fifteen or twenty leaves in a cup of hot water, with half an even teaspoonful queen-of-meadow root, may be used during the day; or larger quantities if necessary. Physicians who do not hesitate to give atropia and strychnine, have started a prejudice against the peach by the assertion that its pits and leaves contain prussic acid. No such acid exists in them, any more than whisky exists in corn. Fermentation may lead to its formation but not otherwise; and a fermented article is not the same as when unfermented, (p. 627.) Always prepare infusion of peach leaves fresh each day.

PENNYROYAL, *Squaw-mint*. (*Hedeoma*.)—A warm infusion of this fragrant herb may be drank freely in colic, recent colds and recently obstructed menses. It is warming and stimulating, aiding to procure a sweat, and is excellent in measles and other eruptive fevers. An essential oil obtained from it is quite pungent, and may be used inwardly or in liniments.

PEPPERMINT. (*Mentha Piperita*.)—None of the mints is so pleasant as this, none is more effectual in colic, neuralgia and

cramps of the stomach, or as a carminative. It is also much used to flavor lozenges and to disguise the taste of unpleasant medicines like castor oil, gentian, and others. Its properties depend on an essential oil, which is mostly used in the form of essence, (see Essences,) ten or twenty drops being usually given in water and sugar. This oil is commonly added to syrups by rubbing it with granulated sugar very thoroughly, then gradually adding of the syrup (with constant rubbing) enough to dissolve this sugar, when it may be poured into the syrup. Five to ten drops of the oil may be used to a quart of syrup. Any of the essential oils may be added to a syrup in the same way.

PEPSIN.—This is the active digesting principle of gastric juice; and the article mostly used is obtained from the stomach of the hog, which is considerably stronger than that from the calf. As it appears in stores it is usually triturated with sugar, for it is too active an article to give in an undivided state. It is used with the meals to promote digestion; and while it often does much good, its value has been over-estimated. It will aid in the digestive process, but will not give to a weak stomach the tone it needs to secrete its own healthy gastric juice; hence pepsin is a present help, while suitable tonics and hepatics are improving the natural powers of the stomach and liver. The usual dose of the powder is about one-fourth of a teaspoonful. It will not all dissolve in water, but needs a little acid. I use about twenty drops of vinegar and two tablespoonsful of water to this amount of pepsin; or half a teaspoonful or less of lemon juice. The liquid pepsin of the stores contains glycerine and hydrochloric acid, and is very objectionable. *Lacto-peptine* is pepsin and lactic acid with sugar of milk, and is milder and to a delicate stomach much more acceptable than pepsin,—which some sensitive persons cannot use at all, be the digestion ever so imperfect. On this account lacto-peptine is more suitable to children with indigestion and diarrhea; and the pepsin from the calf (Boudault's French pepsin being so obtained) is decidedly preferable to hog pepsin for children.

PERUVIAN BARK, Bark. (Cinchona.)—Peruvian barks are of differing medicinal strength, the pale colored being much stronger than the dark red. All are active and rather bitter tonics, especially stimulating the spine and the system of spinal nerves, but not arousing appetite and secretion of gastric juice so much as many

other tonics. It is a valuable addition to other classes of tonics for nervous indigestion, as in the Nervine Tonic; but its principal employment is in malarial troubles as an antiperiodic, due to its stimulating action on the nervous system the depression of which constitutes so large an element of the chill stage. It contains a large share of astringent power, which interferes with the escape of the secretions; and this makes its extensive use objectionable, shutting in the malarial poison and the waste products of the system, unless great care is taken to use stimulants to the liver, skin and bowels. It is best given when the system is lax and the secretions are too free; and so may be used in chronic diarrhea, prolonged menstruation, an excessive and prolonged flow after confinement, excessive expectoration, etc. In powder, the dose ranges from five to fifteen grains; but it is mostly added in limited portions to other agents and used by infusion or in syrup.

Compound Tincture of this bark is made of three ounces bark, an ounce and a half bitter orange peel, half an ounce Virginia snake root, macerated for a week in half a pint of alcohol and a pint and a half of water. It may be given in doses of a teaspoonful or more in hot water as a tonic to the stomach.

Quinine, *Cinchonidine*, *Chinoidine*, and other preparations, called *cinchona salts*, are obtained from Peruvian bark. Their action is similar to that of the bark itself, but very much stronger,—omitting most of the astringent power. They have all been overdone in the most excessive degree. For myself, I almost exclude them from practice; and can do much more effectively without than with them in all malarial troubles except a very few cases of extreme laxity. A grain of quinine, in its loose state, is nearly as large as a grain of Western corn.

PILLS.—Pills are used when concentrated medicines are to be given in the form which will act most slowly. Most pills are for cathartic purposes; but nervines (as asafetida, etc.,) and tonics may be given in this form. Solid extracts may be made into pills,—being either softened with a little essence of peppermint if too hard, or stiffened with powdered licorice root if too soft. Such extracts are often used as a basis for pills, and the desired remedies mixed with them,—as when the extract of butternut or boneset is used to make pills with leptandrin, apocynin, etc. Or these powders may be mixed with flour and glycerine to hold them together. Pills covered with sugar may, in cases of feverishness when a dry

tongue shows the stomach is deficient in secretions, lie many hours without being dissolved. If coated with gelatine, they are not only smaller in size but dissolve more readily. It is difficult for families to make pills for themselves, unless it be of extracts, as in the case of butternut. When they wish to render a strong medicine tasteless to the palate, they would better put the powder in a small gelatine capsule. Very many of the pills now on sale are dangerous in character,—many of the cathartic pills containing henbane or strychnine, and others containing calomel. A pill known as "Cook's Pills" are not my preparation, but an English formula containing mercury. The *Compound Leptandrin Pill*, or *Liver Pill*, mentioned in this volume, is made as follows: Leptandrin one drachm, podophyllin and apocynin each twenty grains, moderately softened extract of wahoo sufficient to hold the powders into a stiff pill mass. Use flour or powdered licorice root to prevent sticking together.

PIPSISSEWA, Prince's Pine, Ground Holly. (*Chimaphila*.)—This little evergreen herb, growing among the decaying leaves of shady woods, is a good tonic alterative, slightly astringent, and acting well on the kidneys. It is used in chronic weakness of the kidneys and bladder, dropsy, and skin eruptions, generally combined with yellow dock and burdock in syrup form. Two pounds will make a gallon of syrup. Combined with poke berries and some prickly ash, it is useful in chronic rheumatism.

POKE, Skoke, Garget. (*Phytolacca*.)—Poke berries are a relaxing agent in sub-acute and chronic rheumatism, usually combined in syrup form with such a stimulating article as prickly ash bark. The juice from the fresh berries may be pressed out and preserved with an equal amount of diluted alcohol; and then when made into a syrup this alcohol evaporated. A teaspoonful or two of the juice every three or four hours, is a suitable dose. If dried, the berries may be made into a syrup in the usual way. Poke root is an undoubted poison, acrid and inflaming to the bowels, and should not be used.

POND LILY. (*Nymphaea Odorata*.)—Both white and yellow pond lily roots are demulcent with mild astringent properties. They may be used by infusion in diarrhea; but their principal value is in poultices on scrofulous ulcers and boils, and as a gargle in sore throat.

POPLAR, White Poplar, Aspen. (*Populus Tremuloides*.)—Poplar bark is a mild but valuable tonic, with moderate astringent properties. It is suitable to all indigestions with weak and languid stomach, water-brash, diarrhea, chronic diarrhea, etc.; and for such purposes may be combined with cherry and bayberry. It also is a good gargle for sore mouth. Yellow poplar is often confounded with this, but they are quite different. Usually it is given in syrup with other agents; or an infusion may be made of an even tablespoonful to a cup of boiling water, and one to three tablespoonsful given every three or four hours. It is often valuable in agues.

POTASSA.—There are numerous compounds of this article. Bicarbonate of potassa is an alkali similar to bicarbonate of soda, but about double the strength of the latter; and is used in rheumatism, the neutralizing cordial, and elsewhere, instead of the soda preparation. Chlorate of potassa has been much praised in sore throat and diphtheria; but it does great and permanent injury to the kidneys, and would better not be used for there are more reliable articles. Permanganate of potassium is a useful disinfectant for the sick room (p. 84.) Iodide of potassium, so much lauded as an alterant, is a miserable and treacherous poison.

POULTICES.—Poultices should be sufficiently soft to accommodate themselves readily to the part on which they are placed, but not so soft as to “run” beyond the intended limits. They should be applied quite warm, for the influence of heat and moisture is a large share of their value; and the better to secure these without too frequently changing the appliance, they should be covered with a piece of oiled silk or rubber cloth, or with a couple of thicknesses of flannel. A convenient plan is to pour the poultice into a bag of thin flannel, folding the open end to retain its contents; but if a poultice is medicated, this method prevents the article from coming in direct contact with the surface. Ground flaxseed is the best poultice from its persistent softness and its long retention of heat. Elm is excellent, but should have an eighth part of lard or oil or glycerine mixed with it to prevent its becoming dry. Bread crumb, oatmeal or Indian meal may be used.

Poultices may be medicated with any desired remedies, as lobelia for relaxation on highly inflamed parts; cherry, pond lily, golden seal, or witchhazle for tonic or astringent purposes; charcoal or myrrh for antiseptic purposes. The drugs should be in fine

powder, and mixed with the meal or bread crumb before the warm water is added; and any oil used should be stirred in last. In the absence of powdered drugs, a strong infusion of the desired article may be used to wet the meal. Bruised herbs, as catnip, mullein, smart weed and others, are sometimes wet with a little hot water, laid thickly upon a part, and then covered well; but this is a *Fomentation* rather than a poultice. *Yeast* poultices are sometimes used; and are made by diluting strong yeast with tepid water and gradually stirring in flour to make a batter, which is then placed near the fire till it rises. It is a gentle stimulant to gangrenous ulcers and to carbuncles, and may be medicated as desired. Poultices should not remain until they get cold, but should be reheated or a fresh one applied as is needed to keep them thoroughly warm.

PRICKLY ASH, Toothache Bush. (*Xanthoxylum*.)—Bark of prickly ash is quite stimulating,—not so potent as cayenne but more so than ginger. It gradually hurries the circulation in the smaller arteries, and gets warmth and fullness of blood to the surface; and is useful in cold and languid and depressed states of the system, and as an addition to alterative preparations. It is seldom used alone; and is an ingredient of the Composition Powder and of Compound Stillingia Syrup. With black cohosh and the juice of poke berries it is of much value in sub-acute and chronic rheumatism; with leptandrin in small powders it arrests lingering bilious diarrhea; and with barberry and wahoo proves an excellent stimulant in chronic malaria with very torpid liver. Its uses are thus chiefly to stir up languid organs, on which account it is not to be used when the stomach is irritable. It increases the flow of saliva, and a dry and furred tongue usually tells when to give a portion of it in chronic cases. It has been highly spoken of in cholera, but will often incite to vomiting. Outwardly it may be used at times in very indolent ulcers. From three to ten grains of the powder may be given three times a day; but it is better used by infusion as ginger is used, though not in such liberal quantities. A tincture and fluid extract are also used; and *xanthoxylin*, its concentrated preparation, may be given in doses of half a grain to two grains. An admirable medicine, but too often given in excess, or misapplied in an over-sensitive stomach. Berries of prickly ash possess properties similar to the bark, but still more stimulating; and they are so largely resinous as to be given only in tincture.

QUASSIA.—One of the bitter tonics, very intense, and usually given in excessive quantities. For languid conditions of the stomach, chronic loss of appetite and indigestion, it is good; but, like gentian, it is best always to combine a very little quassia with a large excess of such mild tonics as camomile and white poplar, and carminatives like coriander and a very little ginger. In such company it is a really useful article to give firm action to the milder agents, and may be used as the Nervine Tonic. A decoction of quassia, with brown sugar or molasses, is a good fly-poison; but that is no evidence whatever that it is hurtful to man.

QUEEN-OF-THE-MEADOW, *Gravel Root*. (*Eupatorium Purpureum*.)—Several articles have these same common names; but the one here meant grows in moist and boggy lands, with erect stems four to six feet high, three to six oblong leaves six to eight inches in length in whorls about six inches apart along the stem, a purple band about an inch broad on the stem at the joints where the leaves grow, and at the top a loose head of delicate purple flowers arranged similar to the white flowers of boneset. It belongs to the bonesets, flowers in August, and may have more than one stalk to a root. This root is a relaxing diuretic and nervine, mild in action, increasing the flow of urine gently, peculiarly soothing to the bladder and womb, and equally soothing to an irritable and aching spine. I prefer it to most articles for difficulties of the kidneys and bladder,—combining it with peach leaves and a very little ginger, by infusion, for aching and sensitiveness; with juniper and a little dwarf elder when a more stimulating and toning action is needed. Its value as a nervine, especially for females, is very great; and for nervousness, tender ovaries and womb, hysteria and similar troubles, it is one of the best of remedies,—used alone, or with comfrey and squaw vine, or added to Mother's Cordial. It may be used by infusion, an ounce to the pint; two to four tablespoonsful every three hours. My preference is for this form; but its fluid extract may be added to syrups, an ounce or more to the quart if in combination with other agents. A high heat impairs it.

RHUBARB. (*Rheum Palmatum*).—Foreign rhubarb root is best when obtained from Turkey, but the India rhubarb is mostly used. The root of our garden rhubarb (pie-plant) is of about two-thirds the strength of the root from India, and is just as good for medicine and more demulcent. In doses of from half to a whole tea-

spoonful it is a gentle cathartic, acting in four to six hours, quite thoroughly dislodging all materials in the bowels without thin stools, and leaving the bowels somewhat toned, soothed and slightly astringed. From these modes of action it is peculiarly fitted for diarrhea, the loose bowels of children, and all this class of maladies. For such purposes it is generally given in small doses—three to five grains every four hours—to get its calmative and astringent rather than its cathartic effect. Usually it is combined with alkali, as bicarbonate of soda, and given in syrup form. Neutralizing Cordial is one of its valuable compounds. Frequently two ounces of rhubarb syrup are added to two tablespoonsful of powdered magnesia, and then mixed with six ounces of cinnamon water. A teaspoonful of this every three or four hours is a good corrective in diarrhea with colic; and larger doses act as a mild cathartic.

Syrup of Rhubarb is made of four ounces rhubarb, nearly an ounce of cinnamon, a fourth of an ounce carbonate potassa, macerated with a pint and a gill of water, strained, and then twenty-eight ounces of sugar dissolved with shaking and without heat. This makes a quart of syrup, of which the dose as a cathartic is a tablespoonful. It may be made by simply adding three ounces fluid extract rhubarb to a quart (less the three ounces) of simple syrup, or syrup ginger, and than the potassa carbonate.

Aromatic Syrup of Rhubarb (Spiced Rhubarb) is made by using a tincture of rhubarb, containing a little cinnamon and cloves and a trifle of nutmeg with the rhubarb, and using two ounces of this in a pint of syrup. It is more aromatic but much less cathartic than the syrup, and in doses of half a teaspoonful or more is good for children with griping diarrhea.

Syrup of Rhubarb and Senna.—Mix one ounce fluid extract rhubarb and four ounces fluid extract senna in enough syrup of ginger to make a pint; add a teaspoonful essence of anise or cinnamon. In doses of a tablespoonful this is a good cathartic, suited to costiveness rather than to diarrhea.

ROCHELLE SALT.—A saline cathartic, mild and cooling, less unpleasant than either Epsom or Glauber salt, and usually well received by an irritable stomach. Best suited to recent costiveness from surfeiting or with slight feverishness. Dose about a tablespoonful. It is the purgative ingredient of *Seidlitz Powder*, which is an excellent mode of giving it.

SAGE.—This old and familiar family remedy is a good gargle in sore throat and mouth, having a few grains of borax added to half a pint. Used in warm infusion with white root and ginger, it promotes sweating and is good in colds. A strong infusion with a little poplar, given cold at bedtime, helps to check night sweats.

SANTONIN.—Santonin is a concentrated preparation from a wormwood of the Levant, and is used to destroy the long round worm. Like all vermicides, it is not without danger. An adult can use two or three grains before breakfast three mornings in succession; and follow with a dose of castor oil, or of rhubarb and senna syrup. A child two years old may use half a grain or less. Being almost tasteless, it can be given in a little syrup or made into lozenges.

SARSAPARILLA. (*Smilax*.)—Honduras furnishes us our true sarsaparilla, much of which is so old as to be nearly inert. A root known as American sarsaparilla is of the same family as the spikenard, is a pleasant and almost aromatic article, has similar properties with the Honduras root, and though not so strong is often better because more easily obtained before its strength is lost by age. Both are good alteratives, acting on the skin and kidneys; and may be considered among the best of the mild articles of this class. It is advisable to combine four parts of sarsaparilla with two parts yellow dock and one yellow parilla, and thus make a more stimulating and toning preparation than sarsaparilla alone. Two pounds of the mixture would make a gallon of syrup; dose two teaspoonsful three times a day. A little essence of sassafras, or less of wintergreen, is a suitable flavoring.

SASSAFRAS bark is an aromatic, which some people like to drink in the spring to "thin the blood." It is not a good article to use in that way, though a very little may be used in alterative syrups. An essential oil is obtained from it in considerable quantities; and this is a good article to dissolve in alcohol and use with other essential oils, or with tincture of lobelia or lady slipper, in liniments for sprains, swellings, rheumatism, etc.

SCULLCAP, *Mad-Dog-Weed, Hoodwort*. (*Scutellaria Lateriflora*.)—Herb scullcap is one of the bitter tonics acting strongly on the nervous system. It is admirable, added in small portions with camomile, cherry, and similar tonics, for nervous forms of indiges-

tion and dyspepsia ; with lady slipper for general nervousness ; with squaw vine and cramp bark for hysteria and female weakness. With dioscorea and blue cohosh it is excellent for nervous headache, wakefulness, delirium tremens, and other depressions. Its infusion, a dessertspoonful to a large teacup of hot water, may be given three or four times a day, one to three tablespoonsful as a dose. Drank freely, it has had repute in hydrophobia and in snake bites. Fluid extract of scullcap may be added to other articles in syrups, an ounce or less to a quart usually being sufficient. *Scutellarin* is its concentrated preparation, and may be used with any of the nervine concentrations, or with hydrastia or salicin ; dose from half a grain to two or three grains.

SENNA leaves are among the prompt cathartics, usually acting in four to five hours, rather stimulating in properties and liable to cause griping.—to prevent which they may be given with cream of tartar and any of the aromatics. Senna is suited to recent febrile and bilious cases, but not when the stomach and bowels are sensitive or inflamed. The dose is a teaspoonful or more of the powder; but this is rarely given, an infusion or syrup being used. It is the principal ingredient of Antibilious Physic. *Syrup of Senna* is made with half a pound of the leaves and an ounce of coriander seeds steeped twenty-four hours in enough warm (never very hot) water to yield half a pint when pressed out and strained. When cold, add to this fourteen ounces of sugar and dissolve by shaking; then two ounces of glycerine. Dose a tablespoonful or more. See Rhubarb for another syrup with senna.

SEVEN BARKS, *Wild Hydrangea*. (*Hydrangea Arborescens*.)—The root of this article is pungent and somewhat bitter, and its strong infusion is often employed as a nervine in the distress caused by gravel. It is no doubt worthy of attention, but somewhat fabulous powers are attributed to it.

SMART-WEEED. (*Polygonum*.)—All the smart-weeds are pungent stimulants; but the variety with large leaves having wavy edges and pellucid dots all over them, is the strongest. Outwardly it makes an excellent fomentation in dysentery, colic, painful diarrhea, cholera morbus, etc. Inwardly a very little may be added to white root and ginger to stimulate and promote sweating in recent colds, and recent obstruction of the menses from cold. For protracted diarrhea without inflammation, a drachm of its fluid extract

to four ounces of Compound Bayberry Syrup is very useful; or it may be added to Neutralizing Cordial. In chronic deficiency of the menses, a small portion may be used with camomile and motherwort, either the infusion or the fluid extract in syrups. Used as a wash or in fomentation on gangrenous and extremely indolent and foul ulcers.

SODA.—*Carbonate of soda* (sal-soda) is a strong alkali, used for cleansing and disinfecting purposes; and a teaspoonful of it in a pint of water may be used as an occasional lotion in some scaly skin diseases, but it is too harsh an article for internal use.

Bicarbonate of Soda is the common cooking-soda,—a much milder alkali than the carbonate, and the article commonly alluded to in this volume. It is frequently used to correct sourness of the stomach in certain dyspepsias and diarrhea; also given in rheumatism and in gravel. No alkali should be continued with the idea of curing any of these troubles, but this is the mildest and most suitable for temporary relief. From one-eighth to one half a teaspoonful may be taken in water, a little at a time every few minutes till the whole is used. It is an ingredient of the Neutralizing Cordial, where it is better, in my judgment, than the much stronger bicarbonate of potassa. Used in poisoning by mineral acids (p. 616.)

Soda Hyposulphite is slightly acid, and a potent arrestor of certain forms of fermentation. For this purpose it is used in what is called “yeasty vomiting”; and for sick headache, which is so commonly connected with that form of fermentation in the stomach. When its solution is spoken of in this book, it means ten grains in four ounces of water; a teaspoonful of which every two hours, hour, or half hour, I have found the best way of using it. Outwardly its solution, several times stronger than this, is valuable in ringworm; and a weak solution may be used as a mouth wash in some degenerate forms of thrush.

SPEARMINT infusion is a pleasant drink to most persons, and may be used in fevers. It gently increases the flow of urine, and has a pleasant nervine action. Its essential oil may be used in the form of essence, or a very little used in liniments for the spine.

SPICED BAG.—The articles used in making Spiced Tea, adding more cloves and a very little cayenne, are put in a bag of soft muslin three to five inches wide and nine or ten long; and a layer a

fourth of an inch thick quilted in loosely. Such a bag, worn over the abdomen, is excellent to keep the surface gently stimulated, thus preventing or relieving diarrhea and colic during the summer. Children are especially benefited by it.

SPICED BITTERS.—Mix the powders of four ounces white poplar; one ounce each golden seal, balmony, ginger, prickly ash and cinnamon; and one-fourth of an even teaspoonful of cayenne. This is a strong and stimulating tonic for very depressed and languid states of the stomach, chronic ague, and similar prostrated conditions. From five to ten grains may be given in powder three or four times a day; or a heaping teaspoonful made in a teacup nearly full of boiling water for infusion, sweetened as desired, and one to three tablespoonsful given as a dose. Of course it is not to be given to a sensitive stomach.

SPICED TEA.—Mix two parts ground allspice, one each ginger and cinnamon, and a tenth part cloves and nutmeg. Other proportions may be used, but these are good. An infusion of this is admirable for diarrhea, colic, cramping pains in the stomach and bowels from cold or indigestion, profuse or painful and too free menstruation, etc. It may be made of any desired strength, as an even teaspoonful or more to a cup of boiling water; and one to several tablespoonsful given warm as needed.

SPIKENARD, Spignet, Pettymorrel. (Aralia Racemosa.)—Spikenard roots are somewhat balsamic and warming, and are among the best of remedies for weakened and congested mucous surfaces, especially of the lungs and womb. Their principal use is in cough syrups,—combined often with comfrey and cherry in recent and irritable coughs, with cramp bark and elecampane and hoarhound in old coughs. It requires about twenty per cent. of alcohol with water to extract the full strength of the root; and this may be driven off by a low heat, a high heat injuring the medicine. The combinations formed with it are numerous, but the following are tried and reliable preparations:

Compound Syrup Spikenard.—Take half a pound of spikenard, four ounces comfrey, two ounces cramp bark, and one ounce each elecampane and tulip poplar, all coarsely ground. Steep them for three days in a pint of alcohol with a pint and a half of water; press out the liquid, add another quart of water and press out again after six hours. Strain the two fluids through cotton flannel, add

three and a half pounds of sugar, and heat moderately with occasional stirring till two quarts remain. When cold, add to this four ounces of glycerine; and one ounce of syrup of tolu may also be added if desired. This is a most admirable cough syrup for chronic coughs with limited expectoration and chest soreness.

Syrup of Cherry and Spikenard.—Mix eight ounces cherry bark, four ounces spikenard, and one ounce each black cohosh and lobelia herb. Macerate them twenty-four hours with a quart of cold water and two ounces alcohol; strain off, add another half pint of water and after a few hours strain this off. This should give a quart of decoction; into which put three and a half pounds of sugar, dissolve it by shaking and without heat, and then add four ounces of glycerine. An elegant and soothing cough syrup, for recent coughs, irritable bronchi and deficient expectoration.

SQUAW VINE, Checker-berry, One-berry. (*Mitchella Repens*.)—A small evergreen herb with nearly heart-shaped leaves and a scarlet berry growing mostly in hemlock woods. It is a mild and soothing tonic to the womb and kidneys, slowly increasing the flow of urine, and relieving the distresses of most female weaknesses while giving strength to the organs. It may be combined with a little juniper or dwarf elder, in syrup, for the kidneys; or with comfrey and some spikenard for female troubles. A typical form for using it is the Mother's Cordial. Its mildness causes it to be neglected as a medicine, but it is all the more serviceable on that very account, requiring small amounts of more positive agents to be added to it. Syrup is the best form for using it, but it may be given in strong decoction.

STILLINGIA, Queen's Root, Yaw Root. (*Stillingia Sylvatica*.)—This root is one of the most stimulating of the alterant remedies, arousing the stomach and all the secreting glands, and acting slightly on the bowels. Usually it is added in moderate portions to the less stimulating alterants, as American sarsaparilla, burdock and bittersweet. Alcohol in diluted form is required to extract its properties. *Compound Syrup of Stillingia* is made of two parts each queen's root and turkey corn; one part each blue flag, elder flowers and pipsissewa, and one-fourth part each coriander and prickly ash. It is now kept on sale in drug stores, and is a most powerful stimulating alterant for depressed and languid conditions. Used in teaspoonful doses three or four times a day.

STIMULATING LINIMENT.—In a quart of alcohol shave two ounces of white Castile soap and add one ounce of cayenne pepper in powder; tincture for a week with frequent shaking, strain off, and add half an ounce each oils of origanum, hemlock and sassafras. This makes a very strong and valuable outward application for chronic rheumatism and neuralgias, over the abdomen and chest for inward inflammation, paralysis, sciatica, and all similar cases. It is not to be used when the surface is hot or inflamed. One part added to three parts of Nervine Liniment make a mild and useful stimulant for outward use in most cases.

SUMAC, *Upland Sumac*. (*Rhus Glabrum*).—The *leaves* of this elegant shrub are astringent, stronger than witchhazle, used as other simple astringents for sore mouth and throat, in the later stages of diarrhea, etc. Sumac *bark* is an astringent with some stimulating and tonic properties, resembling bayberry bark and used in the same cases. It is an excellent remedy for gargles, as a wash and in poultices for foul ulcers, as an injection to the vagina for degenerate leucorrhea and prolapsus, etc. Sumac *berries* are a peculiar acid, the infusion of which is used sometimes in sore throat and as a tart drink in bilious fever.

SUMMER SAVORY makes a pleasant warming drink in recent colds, colic, and menstrual obstruction. Its action is similar to pennyroyal, but its taste is much more pleasant.

SWEATING POWDER.—Cold Powder and Composition Powder, elsewhere described, are admirable sweating preparations. A very different compound for the same purposes may be made as follows: White root four ounces; ginger, dittany herb and sweet marjoram each one ounce. They may be mixed in coarse powder and kept well-corked. A heaping tablespoonful will make a pint of infusion with boiling water; and may be used freely to promote sweating, —a half a teacupful or more every hour, the person being in a warm room, taking a hot foot-bath, and then covering well. It is a very pleasant sweating drink in recent colds, catarrh, measles, scarlet fever, bilious fever, obstructed menses, and many similar conditions. The juice of a lemon to the pint is generally an acceptable addition. Others of the aromatic herbs may be used for the same purposes with white root and ginger, as summer savory, pennyroyal, thyme, sage, and Oswego dittany. These are “simple” but most reliable home remedies.

SYRUPS.—Sugar is used to sweeten and to preserve medicines when prepared in fluid form; and syrups are mostly employed in the treatment of chronic cases where a slow action is needed, though some persons cannot use them well because of the liability of all sugars to sour in their stomach. *Simple Syrup* is made by dissolving five pounds of granulated sugar in a little more than a quart of boiling water, bringing it quickly to the boiling point, stirring briskly till the sugar is dissolved. It does not need “boiling down;” but should make two quarts of clear syrup, or have enough hot water added to it to make it two quarts. This syrup is the one used when fluid extracts are added to make a medicinal syrup (p. 665), and may be flavored with tincture of ginger, essence of peppermint, or other aromatic.

In making medicinal syrups otherwise than by adding fluid extracts to simple syrup, two pounds of the coarsely crushed (never powdered) drugs to be used are generally taken for a gallon of finished syrup, though some articles require rather more. A general plan of proceeding is as follows: Cover the medicines completely with a mixture of one part alcohol and eight part or less water, put them in a tight vessel, and let them stand twenty-four hours or more. Then press out and strain the liquid; and add to the medicines considerably more than enough water to cover them, close the vessel and keep hot for three or four hours. Have a large funnel; put two or three layers of white cotton wadding in its mouth, and then a conical bag of cotton flannel large enough to fill the funnel,—the funnel itself being more than large enough to hold all the drugs. Pour the drugs from their vessel into this bag in the funnel; press them down tightly enough to let the liquid drip through rapidly without running a stream; return the passing fluid to the funnel two or three times, or until it comes through quite clear; and then gradually add water until there has been passed enough to make two quarts and a pint when added to the liquid that was first pressed off and had been set aside. Into this now put eight pounds of granulated sugar and dissolve with stirring at a low heat, the alcohol being thus driven off. When cold, add eight ounces of glycerine, and keep in a cool place. A syrup thus prepared will keep almost indefinitely.

Articles like stillingia and spikenard require more alcohol to obtain their strength. Cherry, black cohosh, lady slipper, and many other medicines need no alcohol; and as heat injures them, they may be prepared in the cold as mentioned for cherry. Vari-

ous syrups have been mentioned at different places, and the following may be named here:

Compound Bayberry Syrup.—Mix six ounces each white poplar, wild cherry bark and bayberry, in coarse powder or crushed; macerate with one part alcohol and ten parts water, and make half a gallon of syrup in the manner above directed. This is a superb tonic and moderately astringent preparation for weakness of the bowels after the acute stage of diarrhea, in chronic diarrhea, persistent looseness and thin stools with indigestion, etc. One to three teaspoonsful may be used four or more times a day. A little fluid extract of smart weed may be added if more stimulant is needed; or an equal part of Neutralizing Cordial if the stomach is sour.

Compound Comfrey Syrup.—Comfrey a pound and a half, hollyhock flowers four ounces, boneset and blue cohosh each two ounces; make into a gallon of syrup. This is a very soothing and somewhat demulcent cough syrup, adapted to inflamed bronchi, soreness of throat and lungs, and all recent irritable conditions of the air passages. It is not amiss to add two ounces of licorice root, and then the hollyhock may be omitted if it is not obtainable.

Compound Gentian Syrup.—Take four ounces each of golden seal, gray-ash bark and dwarf elder; two ounces each gentian, wahoo and prickly ash; make into a half gallon of syrup. This is a potent tonic for chronic ague and biliousness, jaundice, dropsy with liver troubles, torpid liver, and all such depressed and bilious conditions and the indigestion accompanying them. One to three teaspoonsful may be given three or four times a day. In malarial districts it will be found a superior preparation. By adding to a pint of it one ounce fluid extract barberry (not bayberry), a superb *Ague Tonic* will be at hand.

Compound Hoarhound Syrup.—Hoarhound half a pound, cherry bark one pound, blue cohosh four ounces, cramp bark two ounces. Make into a gallon of syrup without heat. It is suited to old coughs with spasmodic paroxysms, weakness through the lungs and excessive expectoration.

TANNIN, Tannic Acid.—This is a very light powder, readily dissolved in water. It is the representative astringent principle of oak bark, nutgalls, hemlock, geranium, sumac, and the other astringents, without the stimulating properties that some of these have. It is useful where the strongest astringents are needed.

THYME.—A familiar garden herb, similar in properties to summer savory but more stimulating. Oil of thyme is excellent for the same uses as oil of origanum ; but it is seldom found in market, the cheaper origanum being substituted.

TINCTURES are preparations of vegetable remedies on, usually, equal parts of alcohol and water. A common proportion is three ounces of the coarsely powdered medicine to a pint of the liquid, which is allowed to macerate for a week or more with frequent shaking and then is filtered off. They are good for outward use, as in liniments; but should not be given inwardly except when added to warm water to dissipate the alcohol, or heated with syrups for the same purpose. Nearly all drugs yield their properties to one part of glycerine and three or four of water; and for inward use the tinctures may all be prepared in this way, and they will keep perfectly well without any mixture with the objectionable alcohol.

TONICS are agents which give increased power of action to the stomach and other organs, and improve the general strength of the system. Usually they are slow and prolonged in the impression they make, and are mostly given at intervals of from four to six hours. They differ considerably in the power and quality of their influence, some being mild, as camomile, feverfew, motherwort, dogwood, cherry, white poplar; others strong, as boneset, columba, scullcap, golden seal, peruvian bark, balmony; and others very strong, as gentian, unicorn, and a few others.

Some tonics possess a considerable share of relaxing properties, and leave the organs, nerves and glands slightly loose and open, as camomile, boneset, gentian; others leave them more astringed and with their secretions somewhat diminished, as cherry bark, dogwood bark, peruvian bark, poplar bark; while yet others exert a more stimulating impression, as unicorn root, and balmony. In using tonics, it is necessary to consider these facts in order to get the most desirable results for particular cases. Numerous articles that act on particular organs act in a measure as tonics to them, as wahoo on the liver, bitter root on the gall-ducts, juniper on the kidneys. It is best to combine some of the stronger tonics with the mild ones; and generally it is well to add a little mild aromatic, as coriander or cinnamon or anise. The proper uses of them are given with the different articles.

UNICORN, *False Unicorn, Drooping Starwort.* (*Helonias.*)—Root of unicorn is three or four inches long, rather larger than a lead pencil, with a number of small fibres, yellowish-white inside and out. Another article sometimes passed off for it (*aletris farinosa*) is smaller in its roots, and dark-brown within and without; but it is poisonous. Unicorn is a strong and stimulating tonic, and may be used in dyspepsia with great depression of the stomach; and in very lax conditions of the womb, with either deficient or excessive menstruation because of such laxity. Dose of the powder, two to ten grains. It is mostly used in small portions with much less stimulating tonics; and one principal use of it is in the Mother's Cordial.

VALERIAN is a foreign root of strong and rather offensive smell, a powerful nervine without narcotic action, and much valued in wakefulness, general nervousness, and hysteria. It is generally given as a fluid extract in syrup, combined with peppermint or other aromatic. From ten to twenty drops of the fluid extract may thus be given every three or four hours. Lady slipper is sometimes called American valerian, but is a different article. *Greek valerian* (*Polemonium reptans*) is totally different from either, its root being a peculiar and persistent expectorant, making a very little of it useful in some classes of cough syrup.

VERVAIN. (*Verbena Hastata.*)—This is the coarse vervain of roadsides and pastures, with insignificant blue flowers in spikes. It is a very bitter tonic, acting on the stomach, gall-ducts and liver. It is useful in loss of appetite with chronic biliary trouble. From its action on the biliary organs, it is of value in chronic malarial troubles. Generally it is best to combine a small portion of it with milder tonics, as dogwood or camomile; and with boneset and wahoo a little vervain makes a searching compound in old ague cases with obstinate constipation. A pound of the herb is sufficient for a gallon of syrup; or an ounce of its fluid extract in combination with others for a quart of syrup.

VIRGINIA SNAKE ROOT. (*Aristolochia.*)—A very active stimulant, more potent than ginger but much less pleasant to use. A quarter of an ounce is sufficient for a pint of boiling water as infusion; of which a tablespoonful every one or two hours is an average dose. It is very useful to promote the eruption of measles or small-pox when this is tardy or receding, for few articles will more

quickly stimulate a flow of blood to the surface and open the pores. A very little added to white root makes a very prompt diaphoretic in chilliness and low fevers. It is much praised as a quick stimulant in snake bites. A tincture is made with an ounce and a half to a pint of diluted alcohol, but is rarely used. A limited portion is sometimes added to peruvian bark and other tonics for its warming action on the stomach.

WAHOO, *Spindle Tree, Burning Bush, Arrow Tree.* (*Euonymus Atropurpureus.*)—Wahoo bark, from the root, is one of the most reliable tonic hepatics, acting slowly but most efficiently throughout the liver and dislodging from it all accumulations of viscid bile. By such action it gradually overcomes bilious forms of costiveness, improves appetite and digestion, and purifies the blood from bile poisoning. Such effects give it great value in biliousness, jaundice, gall-stones, hypochondria, ague, torpor and congestion of the liver, and the many conditions where torpid liver plays a part. It may be used alone; or combined with hepatics, tonics, or alteratives, as needed. With tonics and alterants in syrup, four ounces to the gallon are generally sufficient. It enters into an excellent cathartic syrup with butternut, (p. 649.) Its extract may be used alone in pills, two to four grains being a fair laxative; or it may be softened and used as a basis for incorporating leptandrin and apocynin in pills. *Euonymin* is its concentrated preparation, of which one to two grains, or even more, may be given once or twice in twenty-four hours; or given in company with other hepatics. Fluid extract of wahoo may be added to any syrup where this article is needed.

WHITE Root, *Pleurisy Root, Butterfly Weed.* (*Asclepias Tuberosa.*)—One of the milkweeds, usually growing on thin soils to a height of two to three feet, branching so as to look like a small shrub. Its oval leaves are about three inches long by one inch broad; and the clusters of flowers have an orange-colored tone instead of the pale purple common to most of our milkweeds. The principal roots vary in size from one's little finger to a thumb; and from their unusual whiteness get to the plant its principal common name.

This is one of the most valuable and reliable of all the sweating medicines in every form and degree of fever. It relaxes the skin and sweat glands and small blood-vessels, acting somewhat

slowly but quite persistently, and securing a gentle and steady perspiration. It thus cools the surface when heated with fever; carries off a large amount of waste materials, which accumulate in fevers from the closure of the sweat-glands; and thus lowers the excited pulse gently and brings relief to the whole system, finally leaving the surface soft and the pores open. Its use should be diminished when the perspiration has been well started; and it should be discontinued altogether when perspiration has become abundant.

Like all other sweating medicines, it is best given as a warm tea. A heaping tablespoonful of the powder to a half pint of water is a suitable strength, two to four tablespoonsful may be given every hour, or even oftener in severe cases, until some moistness of the surface has been started; and then the quantity lessened according to circumstances. It is usual to combine with it a moderate quantity of a mild stimulant, as one-sixth to one-fourth part of ginger; and it is used in the Sweating Powder, and in the more stimulating Composition Powder. In sudden high fevers, one-tenth part of lobelia herb with the white root and ginger hastens perspiration; but this addition is seldom required beyond a few hours, and is not advisable when a fever has continued a number of days nor when the patient is weak. Very nervous fever patients generally do well by adding one-fourth part of lady slipper to one-part of white root and one-fourth part of ginger. *Asclepidin* is its concentrated preparation.

WILLOW. (*Salix*.)—Willow bark is obtained from the white and black and red willows, and is a bitter tonic with large astringent properties. It is used in foul and indolent ulcers, for which it is good; but is mostly valued as the source of salicin. *Salicin* is the active principle of all the willows, and is a strongly bitter tonic. As an antiperiodic I value it beyond quinine or any of the cinchona salts, and it has none of the objections belonging to these articles. Two to five grains are a dose, but ten may be given; and may be repeated as elsewhere directed in treating intermittents. As it is soluble, it may be given in water and sugar, or in capsule. As a simple tonic, half a grain to a grain may be given three times a day in convalescence and other conditions requiring it.

WINTERGREEN, *Deer-berry*, *Partridge-berry*. (*Gaultheria*.)—A small evergreen plant in woods, with roundish, dark-green and

fragrant leaves. The leaves contain an aromatic *oil*, for which the plant is especially valued. Essence of wintergreen, made from this oil, is a pleasant addition to bitter tonics and alterative syrups. An infusion of dried leaves is fine for inflamed and weak eyes.

WITCHHAZLE. (*Hamamelis Virginica.*)—The leaves and bark of this well-known shrub are among the pleasantest and best of astringents, possessing also a mild nervine property. The leaves are alluded to when the remedy is spoken of in this volume. An infusion of them is useful in any place where a mild astringent is needed, as for sore mouth, spongy and bleeding gums, diarrhea and dysentery after the acute stage has been corrected, bloody urine; and as a wash in leucorrhea, prolapsus, catarrhal eyelids, etc. They make an excellent application to bleeding and painful piles, whether as a wash, the powder in ointment, or the injection of a few drops of the fluid extract diluted a little. A distilled water from the leaves and twigs, first introduced as Pond's Extract but now greatly cheapened as Distilled *Hamamelis*, contains all the peculiar nervine qualities of the plant and a share of its astringency. It is useful inwardly, and quite so as a mouth wash, though by no means so astringent as the infusion; but outwardly it is an admirable application for bruises, burns, painful swellings, and similar purposes. This plant is another of the fine remedies native to our country that progressive physicians have used extensively for an hundred years and more, and were soundly abused for doing so; but now it is used by everybody including all physicians.

YELLOW DOCK. (*Rumex Crispus.*)—All the dock roots are medicinal and alike in properties, but the common yellow dock is the best. It is an excellent alterative, being at the same time mildly tonic; and is useful in scrofula, scrofulous tumors, boils, and all skin diseases without inflammation and where there is a tendency to moistness and discharges; not suited to inflamed and scaly skin diseases, for it has a slight astringent action. An ointment made by getting the strength of half a pound of fresh root in the same weight of lard, or made with cream, is valued for irritation and swellings. Of the dried root, sliced and bruised, two pounds will make a gallon of syrup in the usual way. It is rarely used alone in syrup, but is combined with other articles, and usually with those of more relaxing properties, as in the following standard preparation: *Compound Yellow Dock Syrup.*—One pound

yellow dock; half a pound of bittersweet bark; four ounces each of figwort, and bark of the American ivy (the Woodbine or Virginia creeper.) Make a gallon of syrup with these as directed at Syrups, using equal parts of alcohol and water for the first steeping, which should be two days. It is given in doses of one or two teaspoonsful three or four times a day.

YELLOW PARILLA, Moonseed, Vine Maple. (*Menispermum Canadense.*)—This is a trailing vine four to eight feet long, in woods, with somewhat seven-angled leaves having the leaf-stem inserted on the under side near one edge. It is often called sarsaparilla, but does not belong to that family. Root of yellow parilla is a bitter and stimulating alterative with tonic properties, acting considerably on the gall-ducts and bowels, thus getting discharges of bile and proving somewhat laxative. It is much esteemed as an alterative in depressed conditions, as in scrofula, constitutional taints, glandular swellings, old ulcers, mercurial diseases, etc. It is generally combined with such relaxing alteratives as American sarsaparilla and bittersweet, four to six ounces of the parilla usually being enough in a gallon of syrup. With the poke berries it is useful in chronic rheumatism. Fluid extract of menispermum may be added to any syrup in the usual way, from twenty to thirty drops being a dose. Parilla is a strong and valuable remedy.

YELLOW POPLAR, Tulip Poplar, White Wood. (*Liriodendron Tulipifera.*)—This is the great white-wood tree of America, peculiarly a giant growth of our own land, growing straight as an arrow to a height of sixty or a hundred feet, with large, blunt, bright-green leaves, and great tulip-shaped orange-yellow flowers. Its bark is a peculiar balsamic tonic, strong in taste but of mild action, and with some nervine properties. It is seldom given alone, as its balsamic quality requires that it be used in moderate portions with milder agents. One part tulip poplar, and two parts each cherry bark and comfrey root, make an excellent tonic for female weaknesses. Outwardly, the fresh bark bruised, or the powdered bark, makes a most valuable poultice in scrofulous and degenerate ulcers.

ZINC.—Most of the compounds of zinc are highly irritating poisons, especially zinc chloride and zinc sulphate (white vitriol.) These are powerful disinfectants, as noted elsewhere, (p. 83.) Oxide of zinc is harmless, and two drachms of it in an ounce of

lard make a white ointment that is quite soothing to skin irritations and drying to discharging surfaces. *Calamine* is a carbonate of zinc, and makes a pink ointment of even better qualities than the white oxide.

ALCOHOL. STRONG DRINK. BEER.

ALCOHOL is a poison. In every form and in every quantity, it is a poison and nothing else. It is totally inimical to the welfare of the system; and nothing but evil, physical and moral, can come from its use whether in large, or small, or "moderate" quantities. From the time of Noah to our own day, it has been an unmitigated curse to the human race. It destroys health, breaks down the stomach and nerves, taints the blood, corrupts the whole system. It alters the substance of organs, reduces wholesome tissue to unwholesome fat, lowers the nutrient powers of the body, takes away tone from the muscles and makes them flabby, attacks the integrity of the brain and dethrones reason. It blunts sensibility of body and mind, degrades a human being to a beastial object, makes the heart callous to every refining instinct, turns kind husbands and fathers into unfeeling brutes or murderers. Its use is the cause of eighty per cent. of the pauperism, corruption, villainy and crime that afflict society; and attaches eighty-five per cent. of the cost that the general public has to bear in supporting police, police courts, poor-houses, jails and penitentiaries. That anything thus blighting and crushing and brutalizing to the bodies and souls of men, can be useful to them in any healthful or remedial sense, is a burlesque upon reason,—a folly born of that ignorance which imagined poisons can become medicines (p. 626), for whose promulgation and defence the medical profession is responsible.

When alcohol is thus arraigned as a source of unmitigated evil, a curse for four hundred centuries, the arraignment includes every form of its use. Whether as old or new or crude or refined or rye or Scotch or Bourbon or any other whisky; whether as cognac or French or California or peach or apple or any other brandy; whether as port or sherry or claret or sweet or sour or native or home-made wine,—no matter what the name or age or manufacture of spirituous liquors, alcohol is the one ingredient that makes them desired by those who use them,—is the one ingredient that leads to the physical, mental, social, domestic and moral ruin everywhere

connected with strong drink. All else is extraneous. There may be many flavors to tickle the palate, but the alcohol they contain is the essential object sought in using them. It is the one poison responsible for the fearful devastation that everywhere and through all the ages has marked the use of liquors. Any talk about "bad" whisky, and "strychnine" whisky, and "doctored" drinks, and "poisoned" drinks, is the sheerest folly of evasion. From first to last, the one poisonous and offending article in all such drinks is alcohol; and the modern and much-praised stupefying drink—beer—is no exception. When I speak of alcohol, therefore, I include every form of these liquors.

Passing by the direct effects of being drunk, and the domestic wretchedness caused by the use of intoxicants, and the momentous moral and social problems connected with the drink habit, I shall give a brief sketch of the evil effects of alcohol from the physiological stand-point. And this sketch will be based upon known facts, carefully and at great length gathered by eminent men, and almost exclusively from observations made in connection with the quite moderate use of liquors.

Upon the stomach alcohol is an irritant, exoriating the nerves, dilating the bloodvessels, perverting the healthy quality of the secretions. It soon roughens the myriads of soft and delicate projections that line this organ, the consequent tenderness and irritation being mistaken for stimulated digestive power. But digestion is diminished instead of being increased; the glands secreting the digestive fluid are injured and the fluid (gastric juice) is weakened in power. Gradually the walls of the stomach thicken; the secretions become viscid and offensive, causing the well-known morning nausea and vomiting; the dilated blood-vessels become enlarged and weakened, in a state of permanent congestion; and the nerves controlling the stomach functions are alternately irritated and depressed, and their healthfulness greatly impaired. Such a stomach, induced by the moderate but habitual use of spirits, is in a perpetual state of chronic gastric catarrh, the most intractable of the indigestions; and is in a fair way to become ulcerated or even cancerous.

It is not possible for the stomach to suffer as described, without the liver simultaneously suffering. Deficient secretion of bile, torpor, congestion and gradual hardening of this organ ensue; and it is at last permanently disabled, often passing into abscesses or into cancer.

Alcohol is absorbed into the blood as alcohol. Advocates for its use formerly contended that it was a food, and kept up animal heat by being burned. Such assertions have long since been disproven totally. It undergoes no change whatever, is not assimilated as food will be, enters into the composition of no tissue, is neither burned nor in any other way made use of; but it simply passes the round of the circulation as a poisoning irritant, damages every tissue it touches and perverts the function of every one, reaches the brain and weakens its delicate fibres and impairs its powers, and finally is ejected as unchanged alcohol by the excretory organs,—doing mischief to the lungs, skin and kidneys as they cast it out.

In traversing the circulation, alcohol charges it with a foreign poison that saturates and shrivels and alters the vital qualities of that fluid. It interferes with the processes of nutrition and the elimination of waste material in every fiber of the body. To carry out waste products from the frame, is of as much importance to life as to send nutritious pabulum through it (p. 165); and it is wholly impossible for any human being to have health if either of these processes is interfered with. Alcohol, as it circulates through the frame, interferes with them both, besides altering the normal condition of every atom of structure it touches,—somewhat as it blanches and shrivels any flesh put into alcohol in a jar. By such processes, and by reducing the powers of digestion, it somewhat limits the amount of food taken, and piles up bloated fat in some people; but the fat is unsound in quality and flabby in character, because it is in part a degeneration of the standard of the tissues and in part an accumulation of waste materials in those deteriorated tissues. The increase of bulk so often proudly pointed to in proof of the benefits of liquors, is a most direct physiological evidence that those liquors have set the system astray and carried it farther and dangerously away from the healthy standard.

The full proof of what this interference with waste and nutrition means to him who uses liquor in moderation, is found in the lowered resistive powers of his constitution. His vital force is weakened, and he is less able than others to cope with the influence of disease. When a quite moderate habitual drinker meets an accident, the shock is more profound and less promptly rallied from than in sober people of similar constitution. He repairs broken bones with more uncertainty; rallies from operations more slowly, and with many more chances for back-sets; is much more liable to

gangrene in wounds and ulcers; and at every turn in the diseases and emergencies of life, he shows his recuperative powers to great if not fatal disadvantage. In sunstroke, the habitual users of strong drink are oftenest attacked and die in largest numbers; and the same is most emphatically true in epidemics of cholera, yellow fever, etc. When unusual demands are made upon the resistive powers of the system, those whose frames have been corrupted and bloated by drink are found to be wofully deficient, practically bankrupt in vitality.

Numerous arguments are made in favor of strong drinks, to show they are useful to the frame. Unfortunately for those who would bolster up the alcoholics, the statements are mere assertions and are totally wanting in scientific fact. When carefully and thoroughly tested by the exact methods of science, and by accurate observations made times without number, they are found to be without a shadow of foundation. Thus, alcoholics hurry the pulse, and therefore are pronounced a stimulant of great value under circumstances of depression and danger. A merely hurried and excited pulse is far from being any proof of strength. It proves weakness and irritation and the presence of danger. There is a vast difference between a natural stimulant and a poisonous irritant,—as much as between a feed of oats and a cruel whip to a tired horse. The former sustains and gives natural vigor; the latter goads dangerously for a time and then increases the exhaustion, precisely as any fever poison hurries the pulse while exhausting the heart. No fact in relation to alcoholic beverages is more overwhelmingly proven than that the pulse excitation following its use is an unnatural and brief irritation, a temporary lashing of the blood-vessels; and soon this fags, and the depression and signs of exhaustion that remain are greater than they were before,—the depression being a real paralysis and in direct ratio to the goading and irritation of the liquor.

Noticing only that, for a time, alcohol arouses the pulse, and refusing to notice the subsequent loss of strength, and partial paralysis of the heart and of the nerves that preside over the circulation, it came to be used in typhus, typhoid, and other low forms of fever. Here, it has been declared, it is "impossible to do without it",—a convenient sophism when argument weakens, for it asks us to take for granted the very thing that is in dispute. Thousands of physicians do "get along without it"; and find sanitary stimulants and proper feeding much more sustaining and

more promotive of life than any whisky, brandy or other alcoholic ever given. Isolated recoveries prove little. Low fever patients recover after using liquors, as very sick people recover from serious accidents and grave diseases, (p. 628); but whether they recover because of using the liquors, or would not have recovered more surely and safely without them, is the question to be answered by careful observations. Multitudes of these have been made, in America and Europe, by hundreds of physicians for many years; and the result has always shown that the use of any liquors in typhoid or any other low fever, instead of being a necessity, is a direct and positive damage to these patients.

Space does not permit extensive quotations, which would fill a volume on any of the points I offer in this chapter; and I am compelled to be content with merely stating the general facts. On this of the use of alcoholics in typhoid, the statistics are overwhelmingly against it. A solitary sample is from the report of Dr. C. E. Steadman of the Boston City Hospital for 1882. He gave a synopsis of 1,042 cases of typhoid fever that had been treated in that Hospital during the previous ten years, and the results of different plans of treatment that had been tested in that large number of cases. These results were as follows:

Death rate in cases receiving no treatment but nursing, 7.8 per cent.

Cases treated with quinine and salicylic acid in variable doses, death rate 9.5 to 11.5 per cent., the higher rate to the larger doses.

Cases treated by mineral acids, death rate 12.8 per cent.

Cases treated by alcoholics, death rate 37.1 per cent.

In all the cases, the same plan of nursing was adopted; and Boston is noted for its fine Hospital, its trained nurses, and the "purity" of its liquors. If, during the ten years, each of the 1,042 typhoid patients had been treated by either plan alone, the results would have been

1,042 patients left to Nature and good nursing,	deaths 81
1,042 patients treated with quinine and salicylic acid,	" 119
1,042 patients treated with the mineral acids,	" 133
1,042 patients treated with alcoholics,	" 386

And yet, in the face of such facts as these multiplied by tens of thousands during the last twenty years, some physicians are so fearful of trusting Nature and good nursing, and so rooted in the belief that poisons must be used in treating disease, that they cling to and defend the use of alcoholics in typhoid fever and many

other diseases. No wonder that the late Sir John Forbes, Queen Victoria's physician, after practicing for a half century in the use of poisons, finally said of all such modes of treating the sick that the poisons were "invoked purposely to *disturb* and *obstruct* and *overwhelm* the natural processes" which tend toward cure. And he added that by the use of poisons "the existing disease is either aggravated directly; or the natural restorative powers of the system are arrested, enfeebled, or misdirected. Our estimate of it must, therefore, be of an entirely *damnatory character*." Thousands of physicians, after long experience, have come to the same conclusion and refused longer to make war upon Nature. Every thinking man, with such a report as the above before him, should see how terribly his chances of recovery are lowered by the use of alcoholics on the prescription of a physician. And the same is equally true as to the use of *any poison*. When the system is most reduced, and Nature stands most in need of help, then it is that all articles of the kind will most surely "obstruct and overwhelm the natural processes" and multiply the dangers.

This worse than useless application of alcoholics in typhoid, illustrates the fallacy of every claim put forth in their behalf. Whatever good is said to proceed from their use, is only a *seeming* good; the accumulated and accurate observations of science proving that the ultimate effects are injurious in the very line where benefit is claimed. It is a favorite belief that alcohol increases muscular strength and endurance, and thus becomes a sort of necessity to the working man. The facts prove that this article, which unsteadies the muscles and makes them helpless in a debauche, also relaxes them, loosens their fibres, and lowers their power of endurance when it is used daily in moderation. Numerous tests of this have been made, and the most careful comparisons instituted between the working capacity of total abstainers and very moderate tipplers. Every such test has proven absolutely that the muscular vigor of the careful tippler is lowered, and by his use of spirits is placed at a decided disadvantage as to that of the abstainer.

It is claimed for alcoholics that they protect one against cold and increase the power of enduring hardships. Accurate tests prove this also to be erroneous; for alcohol, after the first goading of excitement is past, lowers the heat of the body below the normal warmth. And the most trustworthy explorers in Arctic regions —Ross, Kane, Franklin, Perry, McRae, and others—found that

the total abstainers among their crews could endure more and longer exposure than those who took their daily allowance of grog. The latter would be exhilarated for a time, after their potation; but it was always a transient exhilaration followed by the usual depression of heat and energy, while the abstainers held on their way evenly and stood to their work much the better. Liquor blunts the *sensibility* against cold, but increases the danger of freezing by reducing sensibility and internal heat. And then it is claimed that alcoholics sustain against the heat and fatigue of the tropics; but this prop is much weaker than the other, for the lowering of nervous energy they cause is fatal to the endurance of heat,—as abundantly proven by travelers, and by the excessive percentage of deaths from sunstroke among the tipplers and beer-drinkers of our own cities. Volumes of the most positive testimony might be quoted on each of these points; but so abundantly have they been proven that to question them, or to assert the contrary, is but to show entire ignorance of the facts.

The effects of alcoholics upon the nervous system are most deplorable. It *seems* to do good, and is resorted to by the exhausted and the brain-wearied to sustain them. It goads them up for a brief time, as it goads the circulation; but its later and deeper effects are depressant and paralyzing. Here as everywhere, it is the worker of deceit and destruction; and the words of Solomon come to the mind: “Wine is a mocker, strong drink is raging; and whosoever is deceived thereby is not wise.” Wherever it goes, alcohol shrivels and changes the millions of nerve-loops it touches, finally altering the texture of the brain itself; and no nerve-tissue can be vitiated in character and touched corruptably, without being similarly vitiated and corrupted in the performance of its offices. The tippler claims that his dram sharpens the intellect and quickens the emotions; but even while its exhilaration lasts, the outlines of judgment become uncertain and the fancies of imagination contorted and unsteady. And by small daily repetitions, the brain and nerve fibres become permanently more or less altered in character and their functions correspondingly disturbed.

As with opium (p. 565) and all other baneful stimulants, the dose must gradually be increased to obtain the temporary exhilaration; for the structures and their sensibilities are left depressed, and require so much the more irritation to give them the excitement desired. This is an absolute physiological law; and thus it is that the most moderate tippler is continually in danger of becom-

ing a drunkard. Men reproachfully say that such an one should have known when he had "enough," and then stopped. Alas, the same deceitful poison that overturns the nerve-centres of the drunken man till his will has lost control over his staggering limbs, also perverts the healthy tone of the moderate tippler's brain till his will has lost its force and he finds himself a slave to the unnatural thirst for drink that his limited indulgences have created. His altered brain-tissue, gradually changed in texture by the use of small potations, is no longer capable of exercising strong will. His thirst is a passion ; and too often demands gratification at any cost of money, honor, manhood, friends, home, wife, children, or the very soul itself.

Nothing but the grace of God can save a man thus ruled by a demon thirst, created by the drink that has slowly undermined the integrity of his brain structure and therein sapped his power of will. His nerves of taste, as well as those of the brain itself, have been changed by the deceitful poison ; and from the palate throughout the entire frame, the demand for renewed alcoholic stimulation is imperious. Any protracted moderate use of drink, whether through good-fellowship or otherwise, will inevitably establish this thirst. Those naturally most sensitive in nerve and most yielding in will, have it fastened on them soonest. The enfeebled and brain-wearied will have it fastened rapidly, even through the prescriptions of the physicians; for fatigue and disease have already weakened their nerve-tone, and they succumb to the poison more readily. Once established, such a thirst, *due to altered condition of tissue produced by alcohol*, can be controlled only by the utmost efforts and sustaining influences of a true Christian. Like an old scar that has broken deep tissues, it remains for life; like a sprain, it is ready to assert itself on light provocation five, ten, twenty, forty years after it was supposed to have been overcome. So full of "mockery" are the coveted exhilarations of the wine-cup; so "raging" are the tempests of passion following the nerve-perversion of strong drink.

The results of alcohol upon the brain are appalling. It perverts every function of the mind by changing and deteriorating the brain-tissue performing those functions. The brightest intellect is weakened by it, the grandest talents are destroyed, the finest genius is ruined, the kindest natures are brutalized. So soon as its first exhilarations pass off, thought is dulled, fancy is crippled, the purest emotions are degraded, the tenderest feelings are perverted;

and by repetition, in due time the whole man and his mind are made coarse, offensive, repulsive, cruel, brutish. In all cases, reason is partially dethroned while under the exciting and confusing influence of liquor; self and family are abused, the helpless family often suffering the most fearful wrongs; and foul crimes may be committed, for which the law holds the diseased brain and mind irresponsible. In very many cases, permanent insanity results; and it is known that about thirty per cent. of all the inmates of insane asylums go there through alterations of brain-tissue and perversions of mental integrity resulting from the use of alcoholic drinks.

The desire for strong drink on the part of parents, is many times transmitted to children as any other constitutional and nervous disease may be (p. 100.) It is not inevitably transmitted, and it may be overcome in the children, as other diseases may; but the liability to its extension from parent to child follows the same rules of heredity noticed in other maladies, is greatest when both parents are inclined to use intoxicants, and becomes intensified when the habit has run through two or three generations. In this aspect of the question, nothing could be more grievous than the prospect of helping to develop in any man or woman a diseased appetite that may be entailed to blight and curse their own innocent children.

Another aspect of the alcohol question is its general effects upon human longevity. This point has been investigated very carefully and extensively by Life Insurance Companies in America and Europe. Such companies search out the influence of habits upon life, and must need be painstaking and accurate; for an examination into human longevity is with them a business proposition, and their prosperity depends upon their exact knowledge of the conditions which promote or destroy the prospects of life. With emphasis and unanimity they declare that even the moderate use of alcoholic beverages decidedly shortens the Expectancy of Life (p. 19); while a somewhat liberal indulgence on the part of strong and healthy men reduces that Expectancy alarmingly. The statistics are voluminous and startling.

In Great Britain, four of the best Life Insurance Companies make the following showing of deaths among their insured (and be it remembered that only persons of good health and good family record are insured) as compared with the Temperance Provident Institution (insuring only total abstainers) during the same period:

Life Co. A.	issued	944	policies,	had	14	deaths,	or	15	per	1,000
" "	B.	1,907	"	27	"	14	"	"	"	"
" "	C.	838	"	11	"	13	"	"	"	"
" "	D.	2,470	"	65	"	22	"	"	"	"
Temp. P. I.	"	1,596	"	12	"	7½	"	"	"	"

Dr. W. B. Carpenter says the average mortality for the whole population of England is 23 per 1000; those insured in life insurance companies, 11 per 1000; those insured in Friendly Societies (Masonic, Odd Fellows, and others,) 10 per 1000; in the Rechabites, who are total abstainers, 7½ per 1000. This tallies exactly with the above Temperance Institution.

The General Temperance and Provident Institution of London kept a temperance section and a general section. Its tables of expected deaths and actual deaths in each section for 17 years, in groups of 5 years, are as follows:

TEMPERANCE SECTION.		GENERAL SECTION.	
EXPECTED DEATHS.	ACTUAL DEATHS.	EXPECTED DEATHS.	ACTUAL DEATHS.
1866-70, 549	411	1866-70, 1008	944
1871-75, 723	511	1871-75, 1268	1330
1876-80, 933	651	1876-80, 1485	1480
1881-82, 439	288	1881-82, 647	585
2644	1861	4408	4339

These tables show for the temperance section a superiority of 28 per cent. over the general section. The temperance section was not limited to total abstainers, but admitted those whose use of liquors was very moderate.

The Pennsylvania Insurance Report of 1874 gives the following rates of death during the preceding year:

Western Masonic, R. A.	14	per	1000
Odd Fellows,	6	"	"
United Brethren (M.)	8	"	"
Temperance Mutual of Pa.	4	"	"

Statistics of the same tone might be quoted through a score of pages. They all show the same general facts: The death-rate among those insured who use alcoholic and malt liquors is from two to three times greater than among total abstainers; the expectancy of life among those who drink in moderation is but one-

third to one-half that of total abstainers from the thirty-fifth year of life onward. Col. Greene, President of the Connecticut Mutual Life Insurance Co., wrote as follows to Senator H. W. Blair: "Among the persons selected with care for physical soundness and sobriety, and who are, as a rule, respectable and useful members of society, the death-rate is more profoundly affected by the use of intoxicating drinks than from any other one cause, apart from heredity."

When we survey these terrible consequences of the use of alcoholics, one can but exclaim, "Woe to him that putteth the cup to his neighbor's lips." The medical profession is far from being blameless in this particular. By their prescriptions, many a man—aye, and many a noble woman—has had a love of strong drink developed, and many a subjected thirst has been aroused to fury. Under the false theory (p. 626) that poisons can become good remedies,—that the most frightful evils can be changed into wholesome blessings,—the medical profession has made itself the ally of the saloon in fostering the drink appetite, and in making the use of intoxicants appear both useful and respectable. Under the guidance of that false theory, the medical profession furnishes the drinker and the saloon-keeper a final argument for the use of alcohol. Thus the medical profession to-day keeps alive the cause of the drunkard and the saloonist, and saps the foundations of temperance, and prevents the success of prohibitory legislation.

Such a responsibility is a fearful one; and its magnitude increases when we consider that the use of alcohol rests upon a false assertion in relation to the use of poisons, and remember that every supposed need for alcohol in disease and in pharmacy is served *far better* and *without danger* by other means. Every physician who prescribes any form of alcohol for medicinal purposes, or who neglects to direct that it be evaporated from a compound before that compound is taken, consents to this responsibility. He may not *intend* to damage his patients, nor to foster the drink appetite, nor to establish a strong defence for the saloonist. Be his *intentions* ever so good, he treats the sick without considering that every form of alcohol increases the dangers of any disease for which he may give it. It is *always*, under every circumstance and in every guise, an enemy to the stomach, the heart, the nerves, the brain. It always is at war with health, always aids the destructive tendencies of disease, always opposes the natural curative action of the system, (p. 11.) Professional testimony, offered by

the most eminent scholars and careful observers, is overwhelmingly against it. Every medical man owes to his patients and to society the duty of understanding the nature of that testimony, that he may not jeopardize the life of the sick and the peace of families through ignorance of the latest researches in his own profession. As an epitome of these researches, and condensed fragments from piles of the ablest professional testimony, I will here give quotations from three of America's best educated physicians:

N. S. Davis, M. D., of Chicago, the Father of the American Medical Association, after fifty years of bed-side observation and physiological experiment, says, "I have demonstrated by the last forty years of actual experience that no form of alcoholic drink, either fermented or distilled, is necessary or desirable for internal use, either in health or in any of the varied forms of disease; but that health can be better preserved, and disease be more successfully treated, without any use of such drinks."

A few years ago Dr. Davis published a pamphlet giving extensive proof of the physiological damage wrought by alcohol in all its forms. In the course of that pamphlet the following remarks occur:

"At the present time there are but two pretenses, or supposed morbid conditions, for which alcoholic remedies are prescribed by the enlightened part of the profession. One of these is that popularly prevalent condition of exhaustion or impairment from over-work (mental or physical,) or from excessive drains by nursing or unnatural discharges. It is in this large class of half-invalids that the moderate daily use of beer, ale, wine, and occasionally stronger alcoholic drinks, is prescribed on the plea that their power to retard the waste of tissues is conservative, and equivalent to the addition of new matter by assimilation. The *utter fallacy* of this we have already indicted.

"The other morbid condition for which these agents are very generally prescribed, is that weakness of the heart sometimes met with in low forms of fever, and in the advanced stage of other acute diseases. It is claimed that alcohol is capable of strengthening the action of the heart under the circumstances named, and also under the first depressing influence of severe shock. There is nothing in the ascertained physiological action of alcohol on the human system to sustain this claim. Indeed it is difficult to conceive how it is possible that an agent which so plainly and directly diminishes nerve sensibility and muscular action, can at the same time act as a *cordial* or heart-tonic. I have used every available

means for testing experimentally the effects of alcohol upon the heart and blood-vessels, but have failed in every instance to get proof of any increased force of cardiac (heart) action. Simple truth compels me to say that I have never yet seen a case in which the use of alcoholic drinks either increased the force of the heart's action, or strengthened the patient. But I could detail very many cases in which the administration of alcoholic remedies was quieting the patient's restlessness, enfeebling the capillary circulation, and steadily favoring increased engorgements of the lungs and other internal viscera, and thereby hastening a fatal result, where both attending physicians and friends thought they were the only agents that were keeping the patient alive!"

In an address delivered a few years ago by the learned Prof. A. B. Palmer, M. D., of Michigan University, there are the following pithy points:

"We thought, and we may sometimes still think, alcohol makes us witty: we know from observation it makes men silly. We thought it brightened the intellect and might make men wiser: we find that in the long run, at least, it dulls the intellect and makes men foolish. Wine has been called the 'milk of age,' and we thought it supported advanced life: we know that the aged live longer and retain their powers better without their use. As a medicine, we thought it protected against epidemic diseases; we now know it invites attacks. We thought it prevented and even cured consumption: we know it is the most frequent cause of at least one form of that disease.

"As our scientific knowledge of alcohol advances, our practice with it and our language respecting it should change. As to its physiological effects, we have certainly in many respects been mistaken in the past. We have said it excited the vasa-motor nerves [the nerves that control the blood-vessels] of the surface and thus increased vascular action in the cutaneous circulation: we know now it depresses these nerves and causes passive dilatation [congestion] of the surface vessels.* We thought it increased animal

*Allusion is here made to the red nose of the wine bibber, and the dusky purpled cheeks of the beer and whisky drinker. The former is recognized as a condition of disease; but the florid face of the drinker, and especially of those who use beer and ale, is thought to be a sign of rich blood and good health caused by the liquor. Instead of this, it is a condition of weakened and dilated blood-vessels, in which the circulation is slower than it should be and therefore less capable of completing nutrition and enduring cold; and the very color is not the bright and healthy glow of arterial blood, but the dulled hue of partial congestion. Thus in these results pointed at so proudly, "wine is a mocker."

heat: the thermometer shows it diminishes it. We thought that, from more blood coming to the surface and sometimes causing a feeling of warmth, it would diminish the danger from exposure to cold. We find that, from less heat being produced in the centres and more being lost from the surface by the increased blood in the superficial vessels, the danger of exposure to cold under its influence is greatly increased. We said the alcohol taken was oxidized (burned) in the lungs, and that increased heat and other forms of force were thus produced: we find it is not thus oxidized, and that under its influence heat and the other forms of force are lessened. We thought it increased muscular strength, and it was taken to aid men in their work: we find that it diminishes muscular power, both for immediate action and with reference to endurance. We said it was a direct heart excitor: we now know it is a direct heart depressor. We said, and nearly all the text-books still say, it is a cardiac (heart) stimulant: we know from most conclusive experiments it is a direct cardiac paralyzant."

Prof. Wm. Hargreaves, M. D., of Philadelphia, closes an able paper on alcohol in this forceful manner: "From my individual experience, corroborated by so many other physicians,—many of great eminence in the profession,—I am constrained to believe what the late Dr. John Higginbottom, F. R. S., after more than fifty years of practice, said: 'Alcohol is neither food nor physic.' For alcohol, in all its forms, instead of nourishing, poisons; instead of strengthening, weakens; instead of stimulating, narcotizes and paralyzes; instead of increasing the vital forces, diminishes force, produces disease, and is an agent of degeneration and death."

Beer and Beer-Drinking.—The use of beer has rapidly reached to enormous proportions; and so wealthy have brewers and saloonists become by the traffic, that they have grown arrogant with prosperity, openly defy the laws of the country, and herald their determination to rule the land for their own benefit. This growth of a business around which clusters Sabbath-breaking, licentiousness, pauperism, rioting, anarchy and murder, is due to a public impression that beer is a harmless drink, is nourishing, is a means of preventing drunkenness and reforming drunkards from the use of stronger liquors. With these thoughts, millions of men and women indulge in it freely; and people of respectability, who would not touch ardent spirits, use beer regularly and shut their eyes to the surroundings of the saloon.

Every assertion made in defence and support of beer, lager beer, ale, porter and all such malted beverages, is absolutely incorrect, without foundation in fact or science. Beer contains but a limited proportion of alcohol, varying from 4 to 12 per cent., fermented or "hard" cider usually having 7 per cent. of absolute alcohol. One is not likely to drink enough beer to bring him to the state of full intoxication or "dead drunkenness;" but the alcohol in these beverages has precisely the same class of effects as alcohol in whisky or brandy, and acts in exactly the same manner so far as it goes, (p. 628.) Its nature and influence are in no sense or degree altered because of the company it is in; and to the extent of its power it exerts upon nerves, blood-vessels and brain the same damaging influence that a like amount of alcohol in whisky would.

Any nourishing qualities supposed to reside in beer are due to the starchy and saccharine materials it contains. The amount of these is so very small, being chemically changed into other substances during the fermenting and half-putrefying process of manufacture, that a gallon of beer scarcely contains five grains, in all, of nourishing elements. Liebig, Hassels, Playfair, and many other equally eminent and authoritative chemists, have made careful and repeated analyses of the different beers; and the very best they can say of the boasted nourishing properties of those liquors is, that one would have to drink six barrels of beer to get as much nourishment as is contained in a five-cent loaf of bread. It would take a capacious and steady guzzler several weeks to do this, during which process he would have swallowed at least two gallons of absolute alcohol! Such a consumption of alcohol, with a few cents worth of hops and a mass of half-decayed fecula, is a sorry road to get the nutrition of a small loaf of bread!

In the gradual use of this amount of alcohol, an appetite for that article is created. It cannot be otherwise. The growth of the thirst for alcohol is gradual, but is none the less sure. Once this thirst is started, no matter how slow and insidious may have been its development, it demands gratification in the use of increasing amounts of beer and then of stronger drinks. This is the inevitable outcome of any use of alcohol; for its influence in depressing the nerves and changing their integrity, as above shown, (p. 715), can have no other result than to make this craving for more and stronger potations. In this way, the use of beer and other malted drinks leads to a desire for whisky or other strong liquor. Many

resist the desire, but the large majority of beer-drinkers have a fondness for ardent spirits developed by the lighter beverage; and among the young and nervous and weak-willed, that desire sooner or later will be yielded to. Instead of beer preventing intemperance, it increases the amount of stronger liquors used, as ample statistics in America and Europe have proven.

No clearer description of the effects of beer-drinking could well be given than was published a few years ago in the *Pacific Medical Journal*, and which the Home Life Insurance Co., New York, quoted in one of its circulars. I quote a portion of that article:

"The fashion of the present day sets strongly toward the substitution of beer for other stimulating liquors. An idea appears to be gaining ground that it is not only nutritious but conducive to health, and that there does not attach to it that danger of creating intemperate habits which attends the use of other drinks.

"Many years ago, and long before the moral sense of society was awakened to the enormous evils of intemperance, Sir Astley Cooper, England,—an undisputed authority in his day—denounced habitual beer-drinking as noxious to health. Referring to his experience in Guy's Hospital, he declared that the beer drinkers from the London breweries, though presenting the appearance of most rugged health, were the most incapable of all classes to resist disease; that trifling injuries among them were liable to lead to the most serious consequences; and that so prone were they to succumb to disease, that they would sometimes die from gangrene in wounds as trifling as the scratch of a pin.

"It may also be said of beer drinking that there is less limitation to it than to the habitual use of other drinks. It does not produce speedy intoxication, it will scarcely produce active intoxication in any quantity. It makes him heavy, sleepy and stupid. Even in moderate quantities its tendency is to dullness and sluggishness of body and mind. Of all intoxicating drinks it is the most animalizing. It dulls the intellectual and moral, it feeds the beastly and sensual nature. Beyond all other drinks, it qualifies for deliberate and unprovoked crime. In this respect it is much worse than distilled liquors. A whisky drinker will commit murder only under the direct excitement of liquor; a beer drinker is capable of doing it in cold blood. Long observation has assured us that a large proportion of murders deliberately planned and executed without passion or malice, with no other motive than the acquisition of property

or money, often of trifling value, are perpetrated by beer drinkers. We believe, further, that the hereditary evils of beer drinking exceed those proceeding from ardent spirits. First, because the habit is constant and without paroxysmal interruptions, which admit of some recuperation; secondly because beer drinking is practiced by both sexes more generally than the spirit drinking; and, thirdly, because the animalizing tendency of the habit is more uniformly developed, and thus the vicious results are more generally transmitted.

"It is cause of alarm that, just as public opinion, professional and unprofessional, is uniting all over the world in condemnation of the use of ardent spirits, the portals of danger and death are opening wide in another direction,—that of using beer."

THE DIET OF THE SICK.

WHAT a well man eats has much to do with the maintenance of his health and strength. What a sick man eats has a large influence on his recovery, possibly upon his life; and it is of great consequence that his diet should be regulated with the utmost care. The hearty and robust can thrive on almost anything set before them, and those using the muscles actively care but little for the coarseness of their food or the delicacy of its cookery. The sick, the feeble, the delicate, are not so. They have a dainty stomach, and no efforts of will can possibly overcome that daintiness. They must needs have the freshest and choicest foods, have these foods prepared in the most acceptable and delicate forms, or they cannot eat enough to sustain them. It is totally impossible for a sensitive stomach to do otherwise. With those who are ill of a fever or other acute malady, these facts are universally recognized; but they are not so fully understood in their relation to that great multitude of chronic invalids who are not in bed. It is too common for the family and friends of these to drift into the feeling that they can "eat what other folks eat, if they only had a mind to." This is a false idea, and attempts to enforce it cause prolonged illness and much unhappiness. It is physiologically impossible for such invalids to digest the strong foods digested by hearty people, or to digest the best foods done up in a hap-hazard style of cookery. The finest flour may be half spoiled in sour bread, and the best

meats made indigestible by being fried to a brown chip in strong gravy. Chronic patients would nearly starve on such dietary; and those who are blessed with a strong stomach should fully apprehend this fact, and be willing to comfort and assist the suffering one with the choicest foods prepared, in *plain* forms, with all the delicacy and in the widest variety possible for skillful hands to accomplish.

It is not my purpose to make a cook-book, but to give such directions as are necessary for the dietary of the sick. And right here I would say that all water used in cooking should be *soft*, obtained from a good cistern or a running stream. Hard water will damage the stomach of the well (p. 130) and its effect on the digestion of the feeble are really surprising. If soft water cannot be had, then the hard water should have a very little sal-soda added to it before using,—two grains of it, or five grains of cooking soda, being enough to a gallon.

In the way of meats, only the choicest fresh and lean meats should be used. Such food kept till it just begins to "turn" is prized by certain epicures, who at the last pay dearly for perverting their taste in this way. Old meats and tough meats and salt meats are unfit for the sick; and half a pound of really tender steak or chop will give more true nourishment than a pound of coarse and hard meat. All meats should be cooked till the juices are fairly turned in color, but no more. A bit of steak cooked till it is brown or nearly black, has very little more nourishment than a chip and is a tax to the best digestion. Broiling is a much better mode of cooking than frying; and boiling is generally best, keeping the heat merely at simmering point. Meats fried in lard or pork drippings should not be thought of. Beef tea is popularly thought to be rich in nourishment, but has very little nutrition in it; and many prepared beef foods on the market are almost worthless. The leanest meats contain some fat; and if more fatty aliment is required, it can easily be supplied in the way of milk, cream, or butter. Gravy from fried meat is the poorest form of fat. Broths and soups should be made by putting the meat in cold water, and raising the heat slowly till the water about the meat just simmers without boiling. This most fully extracts the nourishing qualities of the meat and makes the broth strong.

Milk is the most nourishing of fluid foods, contains most of the elements needed by the system, and usually is digested rapidly and with ease. A very few people cannot use milk, but they are the exceptions. Milk should always be fresh, from cows not diseased,

and kept where it cannot absorb any odors or unwholesome gases. Its digestion is much assisted by adding two or three teaspoonsful of lime water to a pint. Buttermilk is nourishing, while fresh; and skimmed milk is often quite acceptable to weak stomachs.

Artificial foods are prepared with reference to making them more easily digestible, by partially digesting them beforehand. Some of them are still so charged with starchy materials, and contain so much cane sugar (glucose), as to be poor nourishment at best, and often difficult of digestion. Imperial Granum, Ridge's Food, and several other wheat preparations, come under this head. Merely starchy or farinaceous foods cannot properly sustain the system, (p. 128); and it is an easy matter to starve a child while feeding it plenty of arrow-root or sago, if other and fatty foods are at the time withheld. In most bowel troubles, the starchy class of foods is quite objectionable unless artificially changed.

Another class of artificial foods is known as the "malted." Among these are Horlick's, Keasbey and Mattson's, Mellen's, and several others. Such foods are readily digested and assimilated, and contain good nourishment in a desirable form for feeble persons as well as for children.

Prepared milk foods, such as condensed milk, Nestle's, Gerber's, Anglo-Swiss, and others, are usually surcharged with cane sugar; and while a few seem to do fairly well on them, they cannot be used by the majority to advantage.

Peptonized Foods.—Another mode of artificially preparing, or partly digesting, foods, is by treating them with the juice of the pancreas; and such articles are said to be peptonized, because the pancreatic juice changes the starchy and farinaceous elements into new forms called *peptones*. Such foods are prepared at home, the Pancreatic Liquor being now an article of commerce. But this also may be prepared at home. The pancreas are the "sweet-breads," lying below the stomach; and by butchers usually termed "liver sweet-breads," to distinguish them from other glands. Those from the hog are best; those from the cow doing almost as well, but those of the sheep not being so good. To obtain the pancreatic fluid, remove all fat from the sweet-breads, cut them into small pieces, put these in a broad-mouthed bottle, pour on them their own weight of alcohol and three times their weight of water, cork tightly and set aside for a week,—shaking twice a day. The liquor is then to be strained through close muslin. When added to the food, the heat employed drives off all the alcohol. When

wanted for immediate use, the sweet-bread may be heated with four times its own weight of water, and will be ready in three hours.

To peptonize *milk*, add one-fourth part of water to the milk, heat to 140° F., and then add two teaspoonsful of the pancreatic liquid, and nearly one-fourth of an even teaspoonful of cooking soda. Put in a closed vessel, and place it where it will keep at about 140° F., for an hour or more. Then boil quickly for three minutes. A mere suggestion of a bitter flavor is perceived; and this will increase if too much pancreatic fluid is used or the warmth is continued too long, hence the process will be discontinued at the first slight perception of this flavor. If the milk is first skimmed, and its cream added after the boiling, it will be more palatable. Peptonized milk is very digestible and nourishing.

Gruel, whether of oatmeal, flour or other farina, is first to be cooked very thoroughly, making it quite stiff. When lukewarm, add a dessert-spoonful of the pancreatic liquor to each pint of gruel, and keep warm for two hours. It becomes quite thin; and may be added to peptonized milk or other food. If the thick gruel while boiling hot is added to an equal quantity of cold milk, then each pint treated as for a pint of peptonized milk, the milk-gruel thus made will be very nourishing. If the bitter flavor is too strong, use less pancreatic liquor.

Soups may be prepared by using the thin liquid of peptonized gruel instead of water in obtaining the strength of meat into the soup, boiling in the usual manner. Gelatine may be added to the hot peptonized gruel after the final boiling, and a jelly be prepared.

Peptonized foods are especially valuable in cases of bowel trouble and where intestinal digestion (p. 125) is feeble. Murdock's Liquid Food, and the powdered and liquid Peptonoids prepared by Reed and Carnrick, belong to this class, and are admirable articles of their kind. They contain a limited amount of spirits to preserve them; which should always be driven off by heat before using foods.

Different maladies are accompanied by variations in the powers of digestion; and the diet should be such as can be most easily digested in that malady, or such as will be most appropriate to the conditions of the system at the time. Unless reasonable care is taken in these respects, the food used may not only fail to nourish the body properly, but being undigested it may become a source of direct mischief, (p. 627.) Chronic diseases may thus be greatly retarded in progress; and acute diseases may be given a serious or even rapidly fatal bias by injudicious feeding. Certain classes of

foods must be avoided in different maladies; while certain other classes may be used, and from them a suitably varied table of diet prepared. The following general directions will govern this important problem with suitable accuracy in the maladies named:

Fevers.—Happily the time has gone by when it was considered the acme of science to "starve a fever." The adage grew out of the fact that giving a fever patient hearty food to "keep him strong," prolonged the trouble and risked his life; yet it might easily be that, while "starving" the fever by withholding food on the old and exploded "combustion" theory, the patient also would be starved and actually die for lack of nourishment. Fever patients, above all others, need *very little* food (p. 131); but should have it regularly every three or two hours during the hot stage, and almost exclusively in some liquid form during this period; and at gradually lengthened intervals and in more solid form (yet in limited amounts) after the hot stage has subsided. A too early use of solid food often causes relapses. Rectal alimentation is often needed in fevers.

Among the articles from which a fever dietary may be selected are the following: (I.)—Gruel from oatmeal, Graham flour, or corn meal; but no gruels should be used in typhoid fever, as they all favor looseness of the bowels. Milk, either with a little lime water or malted, milk toast, soaked crackers, Horlick's or Mellen's malted foods, potatoes and cream, rice and milk. II.—Beef tea, which is only moderately nourishing, but considerably stimulating in low fevers. Chicken or mutton broth, peptonized milk, milk-gruel, soup, or other peptones, including Reed and Carnick's beef and liquid peptonoids. III.—Such patients may drink soft water freely; or gum arabic water; small portions of weak lemonade or currant jelly water; rice water; the water off of crude elm bark or sliced apples or oranges; or weak infusion of balm, catnip, spearmint or other mild article, as desired.

Dyspepsia.—In the chapters on dyspepsia, gastric catarrh, and other forms of indigestion, some remarks were made upon diet. Weak stomachs and bowels are very difficult to satisfy as to the food they will appropriate most readily, and each person has to be guided, in part, by his experience; but the following facts are to be borne in mind. Persons with indigestion must *avoid* using coffee, chocolate, rich soups, veal, pork, turkey, hashes, fried meats, stews and gravies; sweet potatoes, pies, pastry, puddings, sauces, made dishes, ice cream, starches and sugar generally, and uncooked

ed fruits and vegetables. They may select a dietary most agreeable to themselves from the following lists: I.—Thin and not rich soups and broths, which may be made more nutritive by pancreatic liquor or the beef peptonoids in small quantities; raw oysters; beef, lamb, chicken, game, broiled or boiled, but not fried as above noted; eggs raw, poached, or soft boiled. II.—Bread, corn, rice, macaroni, sago, tapioca, toast (dry), cream crackers, soda crackers, baked potatoes sparingly by some,—if mealy when cooked, but never eaten fried. III.—Such vegetables as spinach, cresses, lettuce, string beans, asparagus; tomatoes by some, if well cooked and without sugar; ripe peaches and pears, roasted apples but not raw, thoroughly cooked dried fruits, grapes rarely and perhaps not at all; hot water before meals, tea, milk, milk with a little lime water, buttermilk.

Nervous Diseases.—Avoid the use of stews, hashes, sweet potatoes, often white potatoes, gravies, starches, macaroni (gluten), pies and pastry, puddings; and usually strawberries, raspberries and currants. Select the diet from the following list: I.—Mutton, beef, chicken, oyster or clam broth; fish (especially baked), raw oysters, raw clams; meats (sparingly), beef, mutton, chicken, game, eggs, butter, fats in full quantities. II.—Bread, boiled rice or as batter cakes, oatmeal, wheaten grits, baked white potatoes sparingly. III.—Celery, greens in general, green peas, asparagus, fruits that are not sweet; tea or some coffee without milk or sugar, cocoa, hot water an hour before meals; Horlick's or Mellen's food and peptonized foods.

Diarrhœa, Dysentery.—In these and other forms of looseness of the bowels, whether in adults or children, the patient must avoid soups, vegetables, fruits, fried dishes of all classes, fish, veal, pork, lamb, salted meats or fish, sugars and sweets in general, milk unless it has been boiled, all starchy foods except they have been long cooked, and fresh breads. An acceptable diet may be selected from the following: I.—Scraped beef (raw) in small quantities, sweet-breads, chicken or mutton broth, peptonized and malted milk, beef peptonoids of Reed and Carnrick, expressed juice of meats, white of raw egg in water, whey. II.—Baked flour, Mellen's, Horlick's food or other malted food, flour long boiled with milk, macaroni, rice boiled with milk, tapioca, dry toast, crackers, tea.

Constipation.—(See page 349.) Here I wish only to add that persons thus troubled should avoid using all salt or smoked meats and fish, milk, beans, peas, nuts, cheese, pastry and pickles.

Chronic Rheumatism.—Here avoid the use of fried fish, cooked oysters or clams, pork, veal, turkey, gravies and made dishes, sugar and other sweets, and spices; and such animal foods as are suitable should always be used in decided moderation. The dietary may embrace. I.—Fish of all kinds, raw oysters and clams, beef, mutton, chicken, game, strong soups to the thin and anaemic, eggs in moderation. II.—Bread in all forms, rice, all green vegetables and mildly acid fruits, milk in abundance, buttermilk; potatoes in moderation; rice or sago puddings with milk freely. In all except full-blooded persons, the general aim is to be highly nourishing without much meats.

Anæmia. Malnutrition—Any article difficult of digestion is to be avoided in these conditions, such as pork, veal, salt meats (except ham sparingly), hashes, turkey, fatty gravies, pickles, pies, pastry, preserves; thin soups are too weakening to the gastric juice, and anything found to disagree with the stomach must be laid aside. The diet is to be of a class easily digested and calculated to make fat and blood, as: I.—Thick and rich soups, fish, raw oysters and clams, beef, mutton, chicken, game, cream, butter, peptonized foods, eggs. II.—Any bread or farinaceous article found agreeable, including white potatoes; all ripe and well-cooked vegetables, egg and milk puddings, ripe fruits. III.—Milk, fresh warm or malted or peptonized. Between the regular meals and before going to bed, such persons should have a glass of milk or cream, or some chicken or beef broth; and these may be peptonized to advantage, and should be taken warm. The same dietary is suitable in *consumption* and other wasting diseases.

Obesity.—Persons of excessive flesh, when they wish to reduce their obesity should avoid fats, thick soups, sauces, beets, carrots, parsnips, such farinaceous foods as starches, potatoes (both white and sweet), rice, corn meal, hominy, oatmeal, puddings, pies, cakes, and all sweets. They should use only thin soups or broths (sparingly), fish, lean meats, eggs; asparagus, onions, cauliflower, cabbage, spinach, celery, cresses, tomatoes, radishes, squash, turnips; stale bread and toast sparingly, gluten biscuit; grapes, oranges, cherries, berries, acid fruits generally; tea or coffee without sugar or milk.

The time ordinarily required to digest different articles of food has been given at page 141. Articles digested in a short space of time are called "light," and those requiring a long time are "heavy." It must not be forgotten that the manner in which an

article of food is prepared for use, has a very distinct bearing on its digestibility; and also that personal likes and dislikes (p. 135) are to be considered in arranging meals for the sick.

Rectal Alimentation.—In ulcer, cancer, and some other diseases of the stomach, and in some diseases involving this organ indirectly, it occurs that the patient cannot eat enough to sustain life, and would die of inanition unless fed in some other way. Under such circumstances, nutriment may be given by the bowel; and this mode of feeding is called Rectal Alimentation. Only a few articles can be employed in this way, and they must be prepared in a thin fluid form, without salt and in a manner that is quite bland, or else the bowel will reject them. The rectum does not digest the food, but appears simply to absorb it.

Among the foods which may be used in this way, I greatly prefer the water obtained from pearl barley after long boiling; and am surprised that medical gentlemen have overlooked this excellent article for rectal uses. From two to four ounces of it every three hours, is a proper mode of using it. An egg beaten with two tablespoonsful of water, and then stirred into the barley water moderately warmed, is admirable; and this may constitute two or three of the meals in twenty-four hours. For quite delicate persons, the white of an egg is usually better than the entire egg; while some persons will not have their sense of hunger appeased unless two eggs are given at intervals of about six hours, with barley-water between these times. Milk, and very especially the malted milk now in drug stores, may be used in this way; and so may chicken broth, beef broth, peptonized milk, and the Anglo-Swiss Milk Food.

All nutrient enemas should be given at blood warmth (98° F.) Three ounces in bulk are sufficient for an adult; and it is better to satisfy the cravings of hunger by more nutriment in that bulk than by increasing the bulk itself. An enema every three hours is a good rule; but the rectum cannot always be used at will, and this time may have to be extended. The bowel must be kept free of accumulations by the regular use of a large enema to wash it out. In taking the nutrient injection, the patient should lie upon the left side or the back, and remain in this position for some time after. By thus using barley-water with occasionally the white of an egg, I have sustained different patients three, four, and in one case six weeks, without any food whatever being given by the stomach.

THE SICK ROOM. NURSING.

THE sick room should be quiet, open to sunlight, of good size, and capable of being thoroughly ventilated and heated. It should be kept scrupulously clean, and its furniture wiped instead of being beaten with a dusting-brush. No food, or milk, or drinking water should be kept in it longer than needed; for these absorb the unwholesome odors of the room and become offensive. Evacuations of the patient should all be removed and emptied immediately; and vessels to receive evacuations should have a solution of copperas or other disinfectant placed in them before being used. (See the chapter on Disinfection.)

The ventilation of the sick-room should be the most perfect possible, according to the rules given elsewhere on that subject. Windows letting down from the top, to admit the escape of noxious air from near the ceiling, are absolutely necessary. Direct draughts over the patient are to be avoided; but the amount of air supplied to the sick must be very large, and especially so to fever patients. The warmth of the sick room may be about 60° F.; but nervous and chest troubles, and such eruptive fevers as measles and scarlatina, usually require 68° F. or a little above that. Evenness of temperature, with a gradual fall of five to eight degrees at night, is very desirable.

Cleanliness of the patient and his bedding must be constant. His clothing, and especially his bed-clothes, will soon become surcharged with the noxious emanations from his body,—increasing his discomfort and prolonging fever and other troubles. Great care should be given to these things by frequent changes of well-aired clothing. A feather bed should never be used by the sick; but wool, cotton, or straw, or a water-bed for those long confined and helpless. It is not enough that floors and personal linen be clean; but walls, ceilings, and bedding must be equally so. This is why a sick-room should have an oiled floor and large rugs instead of a carpet, and little furniture and no wardrobe supplies in it. All clothing about the patient soiled by discharges must be removed quickly from the room, and washed with complete disinfection (p. 85); and this includes the bed-clothes, which always get saturated with perspiration in a short time.

A sick person should be fed with great regularity. It is cruel to make him wait for his meals, or to supply them after the well have been attended to; and if the well become cross and irritable

at delay in meals, what must a sensitive and sick person endure in his nervous system by such delay? Have the meals ready to the minute, and let other affairs await. The invalid should not be asked what he wants for his meal, or in any way consulted about it except as any named preferences are held in remembrance; but let the food be prepared and brought to him at the stated times, and in the neatest and most attractive manner. Whatever is not eaten should be removed at once, and nothing be left standing in the room under the false idea of thereby tempting the appetite. It simply becomes disgusting to him as he looks at it, and overthrows the little appetite he otherwise might have for the next meal.

While two or three articles at any one meal are sufficient, sometimes a single article in addition to the drink used, these articles should be varied judiciously from meal to meal and from day to day. A well man would soon weary and turn with disgust from pork, potatoes and coffee served to him morning, noon and night; how much more will the sensitive stomach of the sick turn against tea and toast three times a day. Variety is necessary to the well, (pp. 128, 136), and is much more so to the sick; and in a land of abundance there is room for the largest variation in the foods, and changes in cookery are themselves variations in dietary. Sometimes patients crave a particular food that seems unreasonable, and with whimsical persons it is generally unsafe to gratify unreasonable desires; but Nature is superior to Art, and continued earnest cravings may in some instances be gratified cautiously.

Fever patients and others are often too feeble to feed themselves. To make the attempt is exhaustive; to rise in the attempt is not only exhaustive but may be fatal. A good nurse will not only remember this, but will acquire skill in feeding the patient while he is lying down,—either with a teaspoon, or by helping him so he can draw his fluid foods through a bent glass tube, or a quill, or a straw. Such very feeble persons use liquid foods; and it is for them that barley water, milk, milk and lime water, malted or peptonized milk, Murdock's or Mellen's food, and similar fluid articles, are so valuable (p. 729.) Patients of this class sometimes need a tablespoonful or two of food every hour; and it is to these that a single over-indulgence may be fatal when the beginning of convalescence restores an appetite far greater than the powers of digestion. A great danger lies always in giving too much food; rarely is there trouble in giving too little, if only that little is given at moderate and regular intervals.

Next in importance to feeding, is the handling of the sick. This must be done with tenderness. Face, hands, teeth and mouth must be washed regularly and carefully. Tepid water and very little soap for the surface, washing a part at a time and drying gently but well. If the whole body is to be bathed, let a part at a time be bathed and snugly covered, so no chilliness shall be felt; and this should be done *under* the bed-covering, and the patient be moved as little as possible and cautiously. It is wearisome to a very sick person to be moved. Mouth and teeth, gums and tongue, should be washed before and after each meal; for any food or secretions left in the mouth decay rapidly and become exceedingly offensive. For these purposes a little lemon juice, or a few drops of vinegar, may be used in the water; and some like a few grains of sugar with the acid. If the mouth is very sensitive, the white of egg beaten to a froth may be used in water with a couple grains of borax.

The clothing and bedding of the patient, in order to be kept as scrupulously clean as is necessary, must be changed regularly. In doing this, the patient should be handled with caution; and the very sick should have their garments so fastened with tapes that they can be removed and replaced by slipping them under the patient without his rising at all. In making the bed, the sheets should be drawn from under him by fastening a clean one to the soiled one,—drawing the latter away and bringing the fresh one into its place gently, lifting the patient very slightly but not raising him up. A bed should always be made up smoothly, and pillows arranged in the most comfortable manner. Pillows soon get heated and need to be changed often for cool ones, holding the patient's head on the hand steadily while doing so. All clothing for the patient or his bed should be thoroughly aired before using. Once in twenty-four hours is often enough to change a patient; but surgical cases with discharges, bed-sores, or other cases where the bedding is liable to get soiled, need changing two, three or four times in twenty-four hours.

On this question of cleanliness in the bedding, Florence Nightingale makes the following pertinent remarks: "An adult in health exhales by the lungs and skin in twenty-four hours three pints at least of moisture, loaded with matter ready to putrefy. In sickness the quantity is often greatly increased, the quality is always more noxious. This goes chiefly into the bedding because it cannot go anywhere else; and it stays there, because, except per-

haps by a weekly or bi-weekly change of sheets, scarcely any other airing is attempted. A nurse will be careful to fidgetiness about airing the clean sheets from clean damp, the clean night-gown from clean damp, the new mattress from clean damp; but airing the dirty sheets from dirty damp, the dirty night-gown (which she is going to put on the patient after washing him) from dirty damp, never so much as occurs to her. And a mattress is supposed to be aired by somebody else sleeping on it and saturating it with his own damp, before the patient comes to exhale into it the patient's damp."

Every family should be provided with a bed-pan, the flat or shovel-shaped being best. It is difficult for most acute patients to rise to a vessel, and sometimes it would seriously endanger them to do so. A rubber urinal, male or female, should also be provided for the very helpless. To allow evacuations to be made upon cloths when such utensils can be purchased so cheaply, is to prolong the sickness decidedly; and in typhoid and typhus fever, or other low malady, such a method may add that last ounce of uncleanliness which will jeopardize the life. In the unconscious and the paralyzed there may be no alternative; and then an ample piece of rubber or of soft oil-cloth should be placed above the sheet, and soft material to catch the evacuations spread evenly upon that. By this method the bed and bedding will be kept from being soiled. Such a person must be cleansed promptly and thoroughly; and every care taken to prevent chafing and bed-sores as elsewhere directed, (p. 603.) The vessels used should not be emptied in a slop-pail in the room, but carried at once to the water-closet, emptied and cleansed there, and left outside till again needed. Such vessels need scouring with ashes or sand if they become at all offensive, and this in addition to the solution of copperas or other disinfectant poured into them before using. Sometimes they cannot be purified until laved with strong nitric acid by a hand-mop, and then rinsed with boiling water.

The bodily warmth of the patient is always to be watched closely and suitably regulated. Fever patients need plenty of air and but moderate covering; yet some of these, as in typhus and typhoid, get quite cool on the extremities, and require warm applications. When the extremities need warming, it may be done by a fairly heated flat-iron or brick wrapped in one or two thicknesses of flannel and placed near them; or by a jug or bottle filled with nearly boiling water, or by a rubber bottle filled with hot

water. Such utensils should not be placed in contact with the feet and limbs, but near them; and they should not be so hot as to raise the surface heat too much, and their use must be continued so long as needed. Persons insensible or paralyzed may have overheated applications made, and be unable to help themselves; hence a nurse should be careful of the temperature used, and then watchful. If the surface get too hot and lessening the bed-clothing does not give the desired relief, repeated light spongings with lukewarm water will be grateful, drying the parts by patting them with a soft cloth and not by rubbing.

It is frequently necessary to draw off the urine with the catheter; and the bladder needs to be emptied, as a rule, every six or eight hours. In helpless and paralyzed persons this must not be overlooked, though they may not have sensibility enough to signify their wants. It is a very simple affair to draw off the water, if gentleness and common sense are observed. Use a flexible catheter of moderate size, oiled and gently warmed before inserting. For the male, leave the guiding wire in the instrument, and it is generally curved correctly in its lower third. The patient lying on his back with the knees lifted high, insert the instrument with the outer end directed across one or the other hip joint; as the point glides gently down the water passage, let the outer end come over the middle line of the abdomen; and when the point gets to the edge of the share-bone, lift the outer end up gently and in a line with the thigh bones. Use no force whatever, and proceed slowly. If the instrument does not now slip easily beneath the share-bone, carry the outer end down toward the abdomen again, draw it an inch or more out of the passage, then lift it up somewhat farther from the abdomen than before and again move it gently toward the bladder. When the water begins to flow, remove the guiding wire and turn the open end of the catheter into a small vessel placed between the feet on the bed. For the female, no guiding wire is needed; but, the end of the instrument being introduced carefully to the mouth of the water passage, it is to be pressed gently up under the arch of the share-bone with a slight back-and-forth twirling movement between the fingers.

A nurse should be clean, neat, and very quiet. A fussy, talkative, loud-voiced, restless nurse is a terror to a sick man; and especially if a pair of squeaking shoes is added to these undesirable qualities. All the movements of a nurse should be prompt, and quick without noise; and the demeanor gentle, cheerful, watchful,

anticipating the patient's wants, allowing nothing to escape notice, and doing everything in an orderly and before-handed manner. A nurse should never sleep or be laggard at the post of duty. In the country, trained nurses are not procurable; but the sick are dependent upon the members of their own family, or upon the kind offices of sympathizing neighbors. One who attempts such labors of tenderness, should be careful to observe the essential qualities of good-nursing here mentioned, otherwise her ministrations will not avail so much as they should; and the sick one will endure her in silent courtesy, yet actually suffer from her presence. Those who sit up with the sick during the night should be particularly watchful and quiet; and nothing is so thoroughly annoying to the sick, or causes them so much loss of necessary sleep, as a couple of watchers carrying on a whispered conversation in order to keep each other awake. Such night-nurses are simply torturers of the sick. No whispering is *ever* proper in a sick-room, neither is a loud voice; but any conversation should be brief, nothing beyond the absolute requirements of the sick themselves, and always in a distinct but mild tone. Whoso cannot observe these rules, should never attempt to act as nurse or watcher.

If nurses should be quiet in the sick-room, visitors should be more so. The very sick should have no visitors beyond their own relatives or some very particular friend; and these briefly, and only one or two at a time. It is cruel to the sick, the convalescent, the feeble, for visitors to crowd into their room and there talk by the hour. If the invalid does not talk at all, the presence and the conversation of others become a tax and greatly weary him. A real friend to the sick person will consider this fact, and not impose himself and his conversation on the invalid who suffers in silence and is fatigued by the visit. A few minutes, and some pleasant and cheery words, will do good and make another visit welcome. Long talkers, and those who have solemn chapters of gloom to tell, should be excluded as one would flee a pest of Egypt.

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